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The Final Evaluation of Livelihood diversification program in Hwange and Binga Districts was carried out according to the agreement made between the author and the NGOs responsible for its implementation: Cosv, Lead Trust and Lubhancho House.

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# ACRONYMNS

AIDS AGRITEX COSV CA CAADP DAC DTCS EC FAO HIV INCRISAT IPC LEAD LF ME NGO ROM SPSS WB	<ul> <li>Acquired Immune Deficiency Syndrome</li> <li>Department of Agricultural, Technical and Extension Services</li> <li>Coordinating Committee for Voluntary Service Organizations</li> <li>Conservation Agriculture</li> <li>Comprehensive African Agriculture Development Programme</li> <li>Development Assistance Committee</li> <li>Drought Tolerant Crops</li> <li>European Commission</li> <li>Food and Agriculture Organisation of the United Nations</li> <li>Human Immune Virus</li> <li>International Crops Research Institute for the Semi-Arid Tropics</li> <li>International Phase Classification</li> <li>Leveraging Economic Assistance for the Disadvantaged</li> <li>Logical Framework</li> <li>Monitoring &amp; Evaluation</li> <li>Results Oriented Monitoring</li> <li>Statistical Package for Social Sciences</li> <li>World Bank</li> <li>World Eood Programme</li> </ul>
WFP	- World Food Programme

## **EXECUTIVE SUMMARY**

The Livelihood diversification programme in Hwange and Binga Districts is aimed at addressing food and nutrition insecurity challenges faced by vulnerable households by promoting livelihood diversification. The overall objective of the livelihood diversification program is to improve the livelihoods of communities and vulnerable groups by addressing food and nutrition insecurity challenges faced by households in the two target areas. The project's rationale is to increase food access through sustainable livelihood choices and more diverse food production techniques, therefore improving household capacity through increasing agricultural yields, improving diet, generating income from surplus production and creating viable and enduring links between beneficiary farmers and the market. The project also addresses other aspects like inputs supply, extension services and farmers' capacity, the latter, in particular, in the form of management training, community and business structure and financial management. HIV/AIDS and gender mainstreaming are also a component.

The implementing agency of this project is COSV, with two local partners: Lead Trust and Lubhancho House.

This intervention ended on October 31<sup>st</sup> 2014 and this evaluation is the result of the study conducted during its last month. The objectives of this evaluation are to analyse the process of implementation, analyse the impact or changes that have occurred within beneficiary households and the community, identify problems and constraints that have been encountered and identify important lessons to be learned and make recommendations for the implementation of future projects.

Being a final evaluation, this work focuses on assessing the project's impacts, evaluating what and how much changed as a result of this intervention. In order to learn and provide a useful account of these changes, the evaluation uses qualitative and quantitative tools, including control groups.

The geographical and livelihood profiles' targeting go together and are consistent with various needs assessments carried out by different actors: rural livelihoods in the target districts were, at the moment of the intervention, a priority for being more food insecure, poorer and most vulnerable to droughts. Worth noting is also the alignment with Government of Zimbabwe Medium Term Plan, Zimbabwe Agricultural Policy, Zimbabwe CAADP compact as well as the EU overall implementation framework, the "Integrated Programme to achieve Sustainable Food Security".

The main component of the intervention is designed to introduce a combination of new varieties of pearl millet, sorghum, groundnuts and cowpeas, farmed with Conservation Agriculture techniques, but also to build capacity among the target communities to increase the resilience of this farming system to droughts. A marketing component is necessary for the financial sustainability of the agricultural practices introduced by the project. Marketing is explicitly in the expected outcome and has been addressed at various levels, in particular for seeds and vegetables. Seeds producers are supposed to market their products to other farmers, mainly through seed fairs. The construction and set-up of an agri-dealer/mill was considered only when the project was already being implemented, in order to support small-grain marketing of harvest surplus from the increased productivity. The need of another actor, in substitution of market agents, was evident after the realisation that such trade is very thin in volume and commercial millers are simply unfamiliar with the processing of sorghum and pearl millet, and sceptical about levels of demand. Yet, farmers have little incentive to adopt yield-improving technologies without a consistent, commercial market.

The introduction of the Agri-dealer bears these market risks, but the observation is that the relative importance of sorghum and pearl millet in rural food systems suggests substantial opportunities should exist for their commercialization. In this regard, the project's small-grain marketing strategy is relevant, because it provides the possibility to farmers to bear the risks of milling and marketing on themselves.

Another sector of this intervention was the rehabilitation of 6 irrigation schemes and the set-up of 4 institutional gardens. The design of these activities is very technically sound, but it's a too separate component to concur together with the Drought-tolerant crops. The project's design also foresees the support to particularly vulnerable households with a poultry distribution. This is relevant, but the small number of beneficiaries planned (150) does not allows impacts to be sizable.

The results of the evaluation conclude that the project has been a success. The main component of the intervention successfully introduced new small grain varieties and CA practices that had, as main effect, the increase in yields, the increase in income and the diversification of the diet, as subsistence farmers could increase their livestock. Nevertheless, the diversification with pulses has little uptake.

In general, all aspects of capacity building have been treated very extensively and several best practices can be drawn from the project's implementation: training sessions have been planned along the cropping year and these have been complemented by several practical lessons, like the demonstration plots and sharing occasions (brown fairs, exchange visits). In the opinion of the evaluator, this mix should be learned and implemented in other interventions, in addition to the use of contact farmers and the deep involvement of Agritex in all phases of the project.

Even if not all the recommended CA practices have been correctly put in practice in the same way, the increase in yields led to an increase in income. The 20% target of yields increase has been largely achieved for all crops but for groundnuts in Hwange. In Binga, because of the low yields before the project's inception, farmers have shown the biggest progress, but the rate of adoption of CA techniques has been reportedly slower, for beneficiaries' risk aversion and less extension intensity.

Many factors have contributed to this increase in productivity, but the correlation between the possession of livestock and yields is stronger, placing the combination of CA techniques and animal husbandry as a particularly successful practice and a lesson for future interventions. The area cropped, nevertheless, did not increase, as a result of inputs constraints (labour, manure, mulching...). A key determinant, once again, for its increase is the possession of draft animals.

Income also grew, but marketing channels developed little, farmers preferring informal sales. Yet, marketing is crucial for the sustainability of the action. The project actively has sought to develop marketing linkages as production surpluses became important. Its main outcome is the support of a dealer/processor association, JASPRO, based in Jambezi. From the analysis of the association's financial sustainability, the association should be able to product millet flour at a cost that is attractive to consumers in the area; however, the project could do little to support the association's management through the difficult moment of getting the business started: many problems that threaten the sustainability of the association could still arise.

Another component of the project was the rehabilitation of 6 irrigation schemes: even here, the effects have been mixed, but where plots are large enough and market opportunities exist, beneficiaries took the opportunity offered by the project and sensibly increased incomes.

This evaluation makes the following recommendations:

R1. Similar interventions should make use of the lessons learned during this experience, in particular the use of contact farmers, the implication of Agritex and the planning of training together with exchange visits and demonstration plots.

R2. Interventions aiming at introducing and extending CA should do it in combination with support to the livestock, as this offers opportunities to farm larger plot under CA. By doing so, a support to beneficiaries' capacity in animal husbandry, feeding, hay and breeding should be designed.

R3. Marketing support is recommended because it facilitates the uptake of new crops and technologies and guaranties the sustainability of this and similar interventions. This support can take the form of contract farming, but also, and probably more importantly, of training, introduction of grading and standards and the share of marketing information.

R4. More extensively use visual material during trainings, including posters and leaflets to be left among the communities.

R5. The project should prepare a second phase, targeting the development of JASPRO, as a catalyst of local development. This second phase should, in priority, aim at assuring that the necessary skills and capacity is mobilised where needed (storing, accounting, management, etc.), building and stabilising marketing linkages and preparing the associations to deal with all problems (described in Chapter 6) the may arise, whether technical or social. In order to facilitate the passage, a detailed hand-over document should be prepared by the project.

R6. Government agencies and development actors should consider the potential of the JASPRO association as channel of communication and dialogue, and incorporate it into decision-making at local level.

R7. As a basis for initiating dialogue with and providing support to the JASPRO association, Agritex needs to survey and develop an understanding of the association practices as they develop.

R8. The JASPRO association should regularly identify its own areas of weakness, which need to be addressed. The association should engage in other activities that should be considered, benefitting its members, like the organisation of joint transportation (at cost) for smallholder farmers, in order to reduce individual costs and exploit economies of scale; the maintenance of a register of defaulters; linking members to the formal banking sector.

R9. The beneficiaries of the two districts seem to have a different adoption rate and pace, farmers from Binga being more risk-averse. Given the positive feedback received by the exchange visits organised by the project, these should be used in particular to facilitate adoption among farmers with similar characteristics.

## **1. INTRODUCTION**

#### 1.1 Background

Zimbabwe is landlocked and depends on neighbouring countries' transport routes for trading goods. Overall, Zimbabwe is usually a net importer of maize which is the most important staple food. Maize generally grows best in the central, northern and eastern parts of the country, and the drier and less arable southern and western parts of the country are more appropriate for sorghum, millet and livestock. Zimbabwe's population is also concentrated in the more arable and higher-elevation central, northern and eastern parts of the country, as well as the large urban centres of Harare and Bulawayo.

Economic stabilization under the multicurrency system and recent efforts at policy reform during the coalition government spurred vigorous growth, mainly in mining and services (IMF, 2014). GDP growth averaged 10.5 percent during 2009-2012, but the economy has grown slowly in recent years (less than three percent per year from 2012-2014), due to lack of capital and other complex factors<sup>1</sup>.

Zimbabwe's agricultural sector is a key component to its overall economic development, the main source of food at the national level, and a primary source of food and income for most households. However, only 11 % of the total national land area is arable: agriculture accounts for about 20% of the GDP and 66% of the national labour force. The country has a structural domestic cereal production deficit. Cereal production is generally highest in the three Mashonaland provinces, and is highly rainfall-dependent.

Agricultural development also continues to be hindered by numerous challenges including input access and availability, vulnerability to weather-related shocks (droughts and floods), pests/diseases, poor soil quality (especially in communal areas), and lack of credit. Furthermore, unresolved land tenure issues resulting from Fast-Track Land Reform (FTLR) over a decade ago have led to challenges in land tenure, management and improvement in many regions of the country. Finally, the potential impact of climate change in the near term will pose a challenge to agricultural productivity, as the frequency of drought could increase both in intensity and extent.

Hereafter, a presentation of the major challenges for food security organised in the four dimensions: access, utilisation, stability and availability.

Access. In Zimbabwe, about 72% of the country's population lives below the national poverty line. According to the most recent 2013 ZimVAC, rural poverty was the highest in the provinces of Matabeleland North and Mashonaland Central. Rural Zimbabweans purchase 65% of their maize from other local households, and additionally, food purchases for rural households make up 56 percent of overall expenses. Overall, Zimbabweans spend significant shares of their incomes on maize and food overall, leaving less funds for costs such as housing, transport, health and education. Because the formal sector is so small, increasing pressure on heads of households and adults of productive ages leads to increasing

<sup>&</sup>lt;sup>1</sup> Adverse weather conditions, weak demand for key exports, and election-year uncertainty impacted economic activity during 2013. Though the country has recovered from the rampant hyperinflation of 2006-8, little progress has been made towards the Millennium Development Goals, particularly in the fight against poverty: in 2011 the poverty rate was 72% (ZimStat, 2013).

migration for employment opportunities. This is most likely to occur to urban areas within the country (e.g. Harare, Bulawayo, Mutare, Masvingo, or Gweru) or large urban areas in neighbouring countries).

- Utilisation. Malnutrition continues to be a chronic problem in Zimbabwe. Maize still accounts for half of national caloric intake, and this 'mono-diet' contributes to high rates of malnutrition (UN, 2012). Malnutrition can be due to factors such as insufficient caloric intake, inadequate diversification of food production and consumption, poor care/feeding practices, a high disease burden (especially HIV/AIDS), a lack of potable water, and improper hygiene. Overall, malnutrition has decreased slightly between the two most recent DHS surveys completed in Zimbabwe, from 2005/6 to 2010/11. This improvement is small but notable, considering the overall macroeconomic and livelihood deterioration over the same time period nationally. In the most recent Zimbabwe 2010/11 DHS, nationally 33 percent of children under-five are stunted (low height-for-age) and three percent of children under-five are wasted (weight-for-height). Stunting rates are highest nationally in Mashonaland East province, while wasting and underweight statistics are both highest in Matabeleland North province.
- Stability. Drought in Zimbabwe is the most common climate-related factor to impact agricultural production, with related effects on livelihoods, income and food security. Drought is a chronic threat in parts of Matabeleland North and South, Masvingo and Midlands provinces, and other drier parts of the country. Expected climate change is likely to exacerbate these conditions, and could also have an increasing impact on food supply stability and the ability of households to cope with varying income levels in the coming years. Price instability, especially during lean seasons, can affect households' capacity to access food on markets. Zimbabwean markets are also impacted by large markets in neighbouring countries, especially South Africa, Botswana and Zambia.
- Availability. According to the 2010 Crop and Food Supply Assessment Mission, undertaken by FAO and WFP the national production of maize was estimated at 1.35 million tonnes, an increase of 7 % over the preceding year. Despite this, the total utilization of cereals is estimated at about 2.09 million MT (including 1.7 million MT for direct human consumption) which, against total domestic cereal availability of 1.66 million tonnes leaves a national cereal deficit of 428 000 MT. Commercial imports are still restricted by financial liquidity constraints. Total commercial imports, are forecast at 317 000 tonnes of cereals, including nearly 200 000 tonnes of maize to satisfy domestic requirements.

The Livelihood diversification programme focuses on the Hwange and Binga Districts, in Matabeleland North, two areas often classified as crisis according to the Food security IPC v.2. The project is aimed at addressing food and nutrition insecurity faced by vulnerable households by promoting livelihood diversification. The overall objective of the livelihood diversification program is to improve the livelihoods of communities and vulnerable groups by addressing food and nutrition insecurity challenges faced by households in the Hwange and Binga Districts of Matabeleland North. The project's rationale is to increase food access through sustainable livelihood choices and more diverse food production techniques, therefore improving household capacity through increasing agricultural yields, improving diet, generating income from surplus production and creating viable and enduring links between beneficiary farmers and the market. The project also addresses other aspects like inputs supply, extension services and farmers' capacity, the latter, in particular, in the form of management training, community and business structure and financial management. HIV/AIDS and Gender mainstreaming and environmental protection is also a component, although to a lesser extent.

Expected results are: for the drought tolerant crops component (R1) improved food security at household level from both a supply and nutritional point of view. Other Results are (R2) Strengthened capacities of 300 households by providing them with extensive livestock

management skills. And (R3): 10,000 households and 30 government extension workers trained on and use farming practices that ensure better utilization and conservation of natural resources such as soil and water resources.

The logical framework has been revised during the years to reflect the need to adapt to changing conditions, as well as recommendations from monitoring and backstopping mission. The latest version shows a clearer rationale and less expected results, making the intervention logic more coherent. The main component of the project is the introduction of Drought-Tolerant Crops (DTCs) in combination with Conservation Farming.

The implementing agency of this project is COSV, with two local partners: Lead Trust and Lubhancho House. Beneficiaries of the action are the total population (about 50,000 individuals) from 10 wards (6 in Hwange and 4 in Binga), but with different components, the most far-reaching being the seeds distribution (10,000 beneficiaries). Other local institutions are also beneficiaries of the project.

The design of this intervention was based on an assessment was undertaken in 2009, which helped the geographical targeting. Activities started in 2010.

#### **1.2 Implementing Partners and arrangements**

The taking on the actors and their arrangements aims at identifying which settings characterised the intervention. Similar interventions in similar environments can have a different outcome, depending on whom and how the interventions have been implemented.

Cosv is the leading partner of the project. It has one expatriate coordinator based in Hwange and a country office in Harare. Cosv is responsible for the coordination of activities, the running of the project's assets (including the office and support staff), donor-relations, accounting/book-keeping. It received support from the country office and HQ in the form of backstopping, financial control, logistics and networking. As INGO, Cosv has experience in similar projects worldwide and has a long history of cooperation in Zimbabwe.

Lead Trust is a Zimbabwean NGO. The project staff acknowledged a big contribution in terms of ME and backstopping, both from Harare (where it is based) and Bulawayo. All technical staff working full-time for the project is Lead Trust staff. A total of three professionals were dedicated to the project, one as project manager, and two as agronomists (one per each target district).

Lubhancho House is a small local NGO based in Hwange. Apart from receiving contributions from Japan in the past years, it is not exposed to international donors and their procedures, reporting standards and financial practices. It had limited resources, including human. In the framework of this project, it was responsible for the activities in relation to HIV/AIDS that included awareness sessions, trainings and the distribution and follow-up of poultry to particularly vulnerable AIDS-affected beneficiaries. Despite it being a catholic organisation, the communication of topics related to HIV communication and prevention is completely in line with national guidelines and it often employed health workers to conduct the trainings.

Agritex is the extension service of the Zimbabwean Ministry of Agriculture, Mechanisation and Irrigation (MAMI). It is not part of the project consortium, but it signed a Memorandum of Understanding with it and had an important role in the undertaking of the project activities. Agritex staff has been involved in all phases, including trainings. It also contributed to the targeting, distributions, ME and surveys exercises.

#### **1.3 Study Objectives**

The objectives of this evaluation are to:

1. analyse the process of implementation,

2. analyse the impact or changes that have occurred within beneficiary households and the community

3. identify problems and constraints that have been encountered

4. identify important lessons to be learnt and make recommendations for the implementation of future projects

During the evaluation, the DAC (Development Assistance Committee) Criteria2 are considered, namely:

<u>A. Relevance</u>: the extent to which the intervention is suited to the needs and priorities of the target group3.

<u>B. Effectiveness</u>: the extent to which the activity attains its objectives4.

<u>C. Efficiency</u>: it measures the outputs - qualitative and quantitative - in relation to the inputs5.

<u>D. Impact</u>: the positive and negative changes produced by the intervention, directly or indirectly, intended or unintended. This involves the main impacts and effects resulting from the project on the local social, economic, environmental and other development indicators6.

<u>E. Sustainability</u>. Sustainability is concerned with assessing whether the benefits of the project are likely to continue after funding has been withdrawn7. Projects need to be environmentally as well as financially and socially sustainable.

The evaluation is carried out by a consultant, whose complete terms of references are in Annex 1 to this report.

#### 1.4 Rationale of the study

Being a final evaluation, the process focuses on assessing the project's impacts, evaluating what and how much changed as a result of this intervention. In order to learn and provide a useful account of these changes, the evaluation uses qualitative and quantitative tools, designed to be as rigorous as possible. The different tools, such a household survey, are designed to have a confidence level of  $\pm 5\%$  for the resulting indicators. More, the survey also makes use of control groups. This helps drawing conclusions on which components and settings are responsible for the achievements of the desired impact.

The evaluation tools will be described in the next section, but it is important to stress that the Logical Framework (LF) of the intervention has, already, a set of agreed indicators. Furthermore, a baseline survey was conducted in 2011, at the project's inception and some indicators are routinely monitored. This provides for a basis of comparison for many of the indicators.

The indicators for the specific objective, stated by the latest LF are:

- 20% increase in income from drought tolerant crops, vegetables and poultry

- 20% increase in average number of goats and/or chickens owned per household in target area

- 20% increase in average yield of drought tolerant crop cereals and legumes produced in the target areas

<sup>&</sup>lt;sup>2</sup> http://www.oecd.org/development/evaluation/daccriteriaforevaluatingdevelopmentassistance.htm

<sup>&</sup>lt;sup>3</sup> By addressing the following questions: 1. To what extent are the objectives of the programme still valid? 2. Are the activities and outputs of the programme consistent with the overall goal and the attainment of its objectives? 3. Are the activities and outputs of the programme consistent with the intended impacts and effects?

<sup>&</sup>lt;sup>4</sup> By addressing the following questions: 1. To what extent were the objectives achieved? 2. What were the major factors influencing the achievement or non-achievement of the objectives?

<sup>&</sup>lt;sup>5</sup> Considering: 1. To what extent did the project achieve the results? 2. Were activities cost-efficient? 3. Were objectives achieved on time? 4. Was the programme or project implemented in the most efficient way compared to alternatives?

<sup>&</sup>lt;sup>6</sup> When evaluating the impact of a programme or a project, it is useful to consider the following questions: 1. What has happened as a result of the programme or project? 2. What real difference has the activity made to the beneficiaries? 3. How many people have been affected?

<sup>&</sup>lt;sup>7</sup> By asking: 1. To what extent did the benefits of a programme or project continue after donor funding ceased? 2. What were the major factors which influenced the achievement or non-achievement of sustainability of the programme or project?

- Amount of sorghum, pearl millet, cowpeas and groundnuts seed collected for redistribution to the following season's beneficiaries is double the amount received from the program the previous season

- At least 75% of seed producers sell their seeds through seed fairs

- All program components show signs of sustainability (financial, technical, managerial etc) in the fourth year of the program.

The indicators for the overall objective are:

- -10% increase in number of children under 5 years with normal weight
- -10% reduction in number of families in need of emergency food aid assistance
- -5% reduction in number of people living below the poverty datum line
- -Average number of meals consumed per day increases from one to two
- -5% increase in number of households consuming a balanced diet

Being a final evaluation, this work focuses on the indicators for the specific objective, but impact indicators are treated, as well and as far as possible.

This report, therefore, is organised as follows: the present chapter presents the environment, the scope and the method of the evaluation. Chapter two presents the findings on the relevance and design of the intervention, Chapter three analyses the efficiency and effectiveness. Chapter four covers the impact evaluation. Chapter five treats sustainability and the cross-cutting issues of the intervention. The final chapter, six, concludes, summarises the lessons learned and provides recommendations based on the evaluation findings.

#### **1.5 Evaluation Methodology**

Many data for the evaluation come from a household survey. These data from beneficiary households, compared with those from the baseline, as well as those from a control group of non-beneficiaries, allow for drawing conclusions about the changes brought by the project and the settings and circumstances under which they are more likely to take place in a sustainable manner.

Trainings were evaluated through checklists developed for this purpose, focus groups and, when possible, pre- and post- tests.

The financial sustainability, a specific outcome indicator, is assessed with cost-benefits financial analysis.

Despite a wide range of tools set for collecting primary data, a key role is also played by focus groups and secondary data as sources of information.

#### 1.5.1. The survey

The sampling framework is a two-strata, two-stages cluster sampling. Each of the two target district represents a stratum. Villages were randomly selected with probability proportional to size. At village (cluster) level, 11 households were randomly selected, using a random direction from the centre and survey step method.

A total of 416 beneficiary households were sampled, corresponding to a confidence level of  $\pm 5\%$ . A group of 93 households were also sampled, as control from two non-beneficiary wards<sup>8</sup>.

Data were collected with a questionnaire by Agritex officers who attended a specific training session between September 24 and 25. The questionnaire has been field tested during the training and is composed of 6 modules: demography, assets, agriculture, livelihoods & income, food consumption and expenditures. The questionnaire is in Annex 2.

Data were entered by Lead Trust staff on a mask developed on excel. The 2011 Census was used as a basis for calculating population weight by ward. Analysis was performed in SPSS v21.

<sup>&</sup>lt;sup>8</sup> One in the district of Hwange and one in Binga.

#### 1.5.2. Qualitative data

Focus groups have been held in a sample of target areas. The typical attendants were a mix of project's beneficiaries and non-beneficiaries, including men and women of all ages. The discussions did not follow a specific outline, but primarily investigated the quality of activities undertaken by the project (including targeting), the beneficiaries capacities acquired, behavioural changes and the determinants of success for each indicator.

Key informants have been met. These included the project's staff, from Cosv, Lead Trust and Lubhancho House. Furthermore, a number of Agritex officers were interviewed, in particular its District Director. Other key informants were Lukunguni and St. Patrick Hospitals staff and the board of Directors of Good Hope Mother. Finally, the managing committee of JASPRO association was also interviewed.

#### 1.6. Limitations of the Study

This study draws, for the greatest part, from the quantitative survey and the focus groups. Concerning the former, main limitation are: (1) the survey presents a situation at the moment of the interview, with little information captured on the dynamics. (2) errors in understanding and translating are possible. (3) errors could have been arisen to incorrect estimation of figures, especially when recalling (food consumption, expenses ...).

Concerning focus groups, opinion leaders may have biased consensus and some more extreme opinions may have passed without having been investigated.

Overall, even if reasonable, the period of the consultancy was limited, and this could have been another limitation.

### 2. RELEVANCE AND DESIGN

#### 2.1 Relevance

The relevance of an intervention is the extent to which its objectives and design are consistent with recipients' needs and overarching strategies and policies.

The geographical and livelihood profiles' targeting go together and are consistent with various needs assessments carried out by Government agencies (ZimVAC and ZimStat) and others. The "Poverty and poverty datum line analysis in Zimbabwe 2011/2012", (ZimStat, published in 2013) highlighted

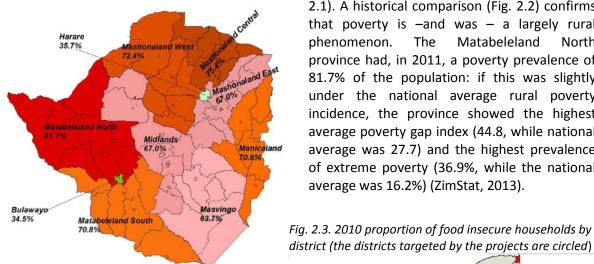
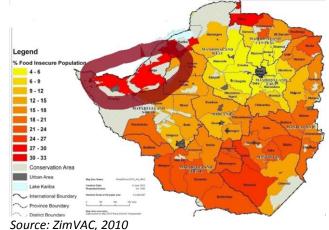
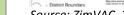


Fig. 2.1. 2011 Poverty prevalence by province

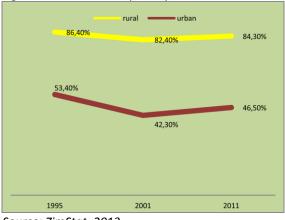
the high prevalence of poverty in rural areas, in particular in Matabeleland North province (Fig. 2.1). A historical comparison (Fig. 2.2) confirms that poverty is -and was - a largely rural phenomenon. The Matabeleland North province had, in 2011, a poverty prevalence of 81.7% of the population: if this was slightly under the national average rural poverty incidence, the province showed the highest average poverty gap index (44.8, while national average was 27.7) and the highest prevalence of extreme poverty (36.9%, while the national average was 16.2%) (ZimStat, 2013).

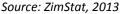




ZimVAC, with an assessment undertaken on May 2010, estimated that the highest prevalence of food insecure people was in Matabeleland North

Source: ZimStat, 2013 Fig. 2.2. Rural vs Urban poverty





(together with Masvingo and Matabeleland South provinces) (ZimVAC, 2010). According to the same source, at the peak hunger period Mbire, Kariba, Binga, Hwange, Chivi, Mwenezi, Beitbridge were be the most affected districts (Fig. 2.3).

Focus groups conducted by the Manjengwa *et al.* (2013) revealed 3 main factors that influenced poverty dynamics: shocks related to agriculture, ill health and the economic crisis.

In rural areas the predominant explanation for why poverty persists was attributed to low agricultural productivity. Focus groups proposed a number of reasons why they could not produce enough, including erratic rainfall, continuous droughts, lack of farming inputs and problems with marketing. Marketing, in particular, was an aspect that many noted: poor harvests can cause food prices to raise, a problem exacerbated by the low market prices that the farmers declared receiving for their products. In areas close to protected areas (like the Hwange district), brought other challenges wildlife to agricultural production. This emphasis on agriculture was also shared by ZimVAC (2010), pointing out the length of the hunger

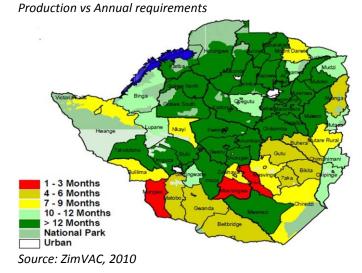


Fig. 2.4. Per Capita 2010 Cereal (Maize and Small grains)

period by district, based on cereal production (Fig. 2.4). FAO/WFP (2008 and 2010) reported that household food security in Zimbabwe has declined due to drastic reduction in food and agricultural production following erratic rainfall and the gross lack of key farming inputs. The worst affected provinces were those that lie in semi-arid agro-ecological regions that traditionally have a grain deficit<sup>9</sup>. The production capacity of farmers in these regions continues to decline as at times they are forced to liquidate their productive assets such as livestock (major source of draught power) in order to make ends meet (FEWSNET, 2008).

Ill health and high mortality rates due to AIDS were also cited as a cause of poverty, especially when the family breadwinner was affected. When the breadwinners die the orphans have to be looked after by elderly grandparents or fend for themselves, thereby creating a cycle of poverty (Manjengwa *et al.*, 2013).

The livelihoods diversification programme, therefore, targets two of the poorest district in the country and focuses on farmers' communities, a choice that is justified by the high poverty and food insecurity incidence of these groups: as a primary target, the project has identified farmers that are capable of supporting their households if given minimal inputs and training. Because food insecurity is generally associated with households that are headed by females, households that have no cattle, households with one or more chronically ill members and households with one or more disabled members, the project's secondary target are households falling into one or more of these categories. Households supporting orphans or headed by orphans are also considered as these are among the most food insecure groups.

Additional target groups include Ministry of Agriculture Department of Research and Extension (AGRITEX) officers<sup>10</sup> in the districts as well as community leaders.

<sup>&</sup>lt;sup>9</sup> Which are mainly the provinces of Masvingo and Matebeleland.

<sup>&</sup>lt;sup>10</sup> This is also relevant: Mukarumbwe (2009), using a logistic regression modelling small grains production, showed that, among others, extension is a key factor.

General poverty and chronic food insecurity has led to reduced diversity of household consumption and has contributed to increased prevalence of chronic malnutrition young children. According to the joint FAO/WFP Food and Crop Supply Assessment Mission of 2010, another important compounding factor is HIV and AIDS which has affected production (labour) and access (increased health expenditure and reduced income) at the household level and food utilization for the individual. The project also targets people affected by HIV/AIDS: households supporting orphans or headed by orphans will also be considered as these are among the most food insecure groups

#### 2.2. Design

The main component of the intervention aims at increasing small grains productivity with Conservation Agriculture techniques. Large parts of the SADC are semi-arid, with erratic rainfall and nutrient poor soils. While maize is the major staple that is grown in this region as a whole, sorghum and millet were found to be important crops in these driest regions where rural farm households have limited production capacity and lowest incomes (FAO/WFP, 2008). Sorghum and millet being more droughts tolerant, they have a strong adaptive advantage and lower risk of failure than other cereals in such environments.

In facts, a large documentation in literature provides evidence that these crops have a better potential of contributing to household food security than maize in these regions. Sorghum and millet have been noted as staple food grains in many semi-arid and tropic areas of the world, particularly in Sub-Saharan Africa because of their good adaptation to hard environments and their good yield of production (Dicko et al., 2005). Taylor et al (2006) expands by describing sorghum and millet as generally the most drought-tolerant cereal grain crops that require little input during growth.

Van Oosterhout (1995) pointed out some advantages of small grains (sorghum and millets) over maize as:

- A smaller amount of flour is needed to cook the main meal compared to maize;

- A meal cooked from the small grains satisfies hunger for a longer period and gives more energy (which is especially important for persons who do heavy manual labour like farmers);

- The small grains store better (usually 3-5 years) than maize which cannot be stored beyond eight months. Local cost free storage technologies are available whereas maize needs poisonous organophosphate protectants, often unaffordable by farmers;

- Seeds of several varieties of small grains are available for planting from the farmers own granary when needed and can be exchanged with neighbours and relatives - they might not need to be purchased;

- In years of low rainfall, small grains will give some yield especially when grown in a multi-cropped system.

Even if, as some old literature points out11, challenges exist, new sorghum and millet varieties can reduce the probability of zero yields. In this way, they can make a significant contribution to

<sup>&</sup>lt;sup>11</sup> According to Sukume *et al* (2000), production of maize continues to dominate in Zimbabwe''s semi-arid regions compared to small grains sorghum and millet because it offers higher yields: they noted that low yields of small grains have acted as a major obstacle and challenge for communal farmers in Zimbabwe's semi-arid regions to expand and adopt production of small grains on a large scale compared to maize, especially considering the limited land resources available. Macgarry (1990) pointed out some of the challenges that communal farmers' face in sorghum and millet production and why they end up preferring maize. One of these major challenges is the depredations of the quelea birds on sorghum and millet than does maize. Furthermore, rising labour costs in small grain production have affected most farm operations, from land preparation, weeding, bird scaring to harvesting and grain processing; in addition, the ease with which maize can be processed compared to the traditional staples of sorghum and millet is the other main reason why maize became widely accepted even in Zimbabwe's semi-arid regions during the green revolution (Alumira and Rusike, 2005). Also Sukume *et al* (2000) have explained lack of processing technologies as yet another factor that has hindered the development of alternative formal markets for sorghum and millet. By using traditional processing technologies, sorghum takes longer to process than maize especially during harvesting and this has reduced its demand by even the poorest of the poor communal households (Mazvimavi, 1997).

household food security in drought years. However, Alumira and Rusike (2005) argued that changes in varieties alone could not guarantee increased yields from sorghum and millet without being accompanied by improved crop management methods such as better soil fertility management. According the project's rationale, this should be provided by Conservation Agriculture.

Conservation Agriculture (CA) refers to the particular technology of using planting basins and soil cover which was developed by Brian Oldrieve (1993)<sup>12</sup>. This is a modification of the traditional pit systems once common in southern Africa and is a variation on the Zai Pit system from West Africa, which may also be considered as a CA technology. Most communal/smallholder farmers apply unsustainable soil and crop management practices; in many cases land preparation is at a low standard, planting is often delayed and crops are not well managed (Marongwe et al., 2011).

CA as defined and practised in Zimbabwe today (as Conservation Farming<sup>13</sup>) is based on the simultaneous application of three main principles: minimum mechanical soil disturbance; maintenance of ground cover with organic matter; and diversification of crop species grown in rotation, grown in sequence or association, complemented by improved management of the various components through intensive participatory extension support<sup>14</sup>.

Specifically a set of techniques that should be practiced as a whole is promoted by the Zimbabwean Conservation Agriculture Task Force<sup>15</sup> (ZCATF) and include:

- 1. basins digging,
- 2. application of manure fertilisation,
- 3. mulching and crop rotation.

CA was promoted to the smallholder sector by donors and NGOs in the 2003/2004 agricultural season to sustainably address the low productivity of farmers and improve their food security and overall cereal production.

Yield advantages in CA systems compared to conventional systems have also been observed across several agro-ecological regions of the country (ICRISAT, 2009).

Alumira and Rusike (2005) point that sorghum and millet do not yield much crop residue, which plays a very important role to communal farmers in terms of animal feed and crop manure. Similar observations were noted by Mapfumo *et al* (2005) that livestock depend upon crop residues for survival during winter, mainly from maize stoves.

Another very important factor, which has been acting as a production constraint towards sorghum and millet production, is changing food preferences: as incomes rise, consumers tend to purchase wheat, rice and in some cases maize, rather than traditional coarse grains. As a result, communal farmers tend to view sorghum and millet production as having lower returns than other enterprises.

<sup>&</sup>lt;sup>12</sup> CA was first implemented by Brian Oldrieve at Hinton Estates in north-eastern Zimbabwe in the late 1980s. The farm and surrounding areas were able to tremendously increase yield levels and successfully reduce soil erosion through the use of conservation farming (comprising reduced tillage and mulch retention) (Oldrieve, 1993).

<sup>&</sup>lt;sup>13</sup> The CA option that has been mostly promoted in Zimbabwe is a manual system based on planting basins that act as planting stations for the crops (Twomlow et al., 2006). This option was promoted mainly to address the draught power shortages in the communal farming sector, which delays planting and consequently negatively affects final crop yields. This technology using planting basins is locally labelled as 'conservation farming' to differentiate it from the other CA practices promoted in the region.

<sup>&</sup>lt;sup>14</sup> CA tries to remove unsustainable parts (tillage, residue removal and mono-cropping) from the conventional agriculture system, thereby addressing most of the issues restricting yield increases. These issues are the following:

<sup>-</sup> High water losses through surface run-off from agricultural lands are addressed through factors that increase infiltration and reduce water evaporation (minimum soil disturbance and maintenance of soil cover).

<sup>-</sup> Soil fertility decline is addressed by increasing soil carbon through the use of organic materials as soil cover and the increased efficiency of fertilizer use through precise application.

<sup>-</sup> Rotations with legumes and agroforestry species in rotations and interactions further add fertility to the soil.

<sup>-</sup> Poor management in conventional agricultural systems is addressed through attention to details and complementing extension support during CA promotion.

<sup>-</sup> Increased crop productivity in CA systems removes pressure from marginal areas as CA farmers are able to meet their food requirements from smaller land units.

<sup>&</sup>lt;sup>15</sup> The need for coordination of CA activities emerged during these early stages, which resulted in the formation of the CA Task Force in 2003 at the request of donors to set up technical guidelines for implementing CA. Membership is currently made up of NGOs, CGIAR centres, universities, the Ministry of Agriculture and the Food and Agriculture Organization of the United Nations (FAO).

In recent years, there has been a rapid increase in the number of farmers practising CA technologies involving planting basins (Marongwe et al., 2011), especially due to the critical inaccessibility of inputs by smallholder farmers. However, the growing number of farmers reported to have adopted CA do not equate to the proportion of area under CA because individual farmers have the tendency of putting very small proportions of their farm lands under CA, citing labour constraints mainly for weeding but also for basin preparation. Farmers are facing challenges in retaining crop residues in the field as a result of communal grazing systems. Crop rotations have also not been adequately implemented by CA farmers (ICRISAT, 2009). In conclusion, the combination of small-grain cropping and CA has the potential to significantly increase yields and agricultural productivity in a sustainable manner even for poorly resourced farmers, improving their food security and often enabling them to sell surplus. However, the success of the choice to introduce CF, therefore, critically depends on:

- 1) whether the project and extension officer introduced the whole package of practices, and
- 2) whether the conditions to scale-up the technology to larger areas are taken into account, faced and addressed.

As the project's title suggests, this intervention also aims at diversifying rural livelihoods. Because target areas are vulnerable to unpredictable extreme weather conditions, diversify income sources can be a good strategy to cope with crop failures and maintaining a level of food security. Diversification has been put forward as one of the strategies households employ to minimize household income variability and to ensure a minimum level of income (Alderman and Paxson, 1992).

A key question, when designing an intervention to diversify rural livelihoods is what to diversify: do we want to diversify the economic opportunities in a certain geographical area? Do we want to diversify the income sources at household's level, or even within the household? If the problem addressed is, as the literature quoted put forward, to reduce households' vulnerability to climatic shocks, opting for diversifying livelihoods at households level would be the best choice. The project's strategy went for a mix of these options, i.e. to support drought-tolerant pulse crops and irrigation schemes in producing and marketing a wider range of horticultural produce. Along this line, four institutional (orphanages and hospitals) gardens were also set-up. This seems justified by the fact that the combination of drought-tolerant crops and conservation farming requires more labour and, without a proper feasibility study, the assumption of more resources available to diversify incomes does not necessarily hold. This is correctly reflected in the intervention's proposal and Logical Framework, but the project is only marginally designed to reduce beneficiaries' vulnerability to crop failures with a diversified income<sup>16</sup>. The rehabilitation of the irrigation schemes and the set-up of the institutional gardens seem a too separate component: the intervention takes advantage of the irrigation schemes in need of rehabilitation - a very demand-based strategy itself - to target a different group of beneficiaries, to engage in activities that represent a diversification of the economy of the area, but the whole project's rational could be standing without.

Specific vulnerable groups (Persons living with HIV, orphans, widows) are the target of poultry distributions and training. Targeting AIDS-affected is justified by the reportedly high prevalence (the author could not find specific data) and their reduced ability to engage in farming. Poultry seems an activity that is in line with these capacities and at the same time could offer a more protein-rich diet, although other species could have been tested (like guinea fowls or ducks). This activity is coupled with awareness sessions addressed to the whole community. This component is certainly relevant,

<sup>&</sup>lt;sup>16</sup> In the Special Programme of Food Security, FAO launched a diversification component which bears similitudes with the project's rationale, but the FAO approach focused on developing a gradual multilevel approach based on simple, sustainable and replicable technologies for use by small producers. The difference with the COSV-LT intervention is that the diversification component is not replicable.

but, given the limited number of beneficiaries, unlikely to have a sizable impact on the project's outcome.

Marketing is necessary for the financial sustainability of the agricultural practices introduced by the project, in particular the crop intensification. Marketing is explicitly in the expected outcome and has been addressed at various levels, in particular for seeds and vegetables. Seeds producers are supposed to market their products to other farmers, mainly through seed fairs. Irrigation schemes are supposed to engage in marketing with long-term buyers and at farm gates. The project document has been modified as to include the support to outlets being built on the roads, although not for every groups, with contribution from the beneficiaries.

The construction and set-up of an agri-dealer/mill was considered only when the project was already being implemented, in order to support small-grain marketing of harvest surplus from the increased productivity. A rider was submitted and approved by the donor. This strategy is worth exploring, concerning its relevance and design. At regional level, despite their relative importance in the food systems, very little sorghum or pearl millet is commercially processed. Rough estimates suggest less than 3% of Sub-Saharan Africa's sorghum production is used in the formal food and feed industries. Industrial utilization of pearl millet is rare.

Zimbabwe annually produces about 100,000 MT of sorghum and 45,000 MT of pearl millet. About 20% of the sorghum is commercially processed, mostly for use as malt in the opaque beer industry. The animal feed industry will use sorghum if this is available at prices substantially lower than the price of maize. However, average levels of utilization remain small. Small quantities of pearl millet are also used for beer malt and animal feed.

Though sorghum and pearl millet are most commonly consumed in various forms of thin and thickened porridge, industrial processing of sorghum and pearl millet meal has been relatively limited. In comparison, maize meal is much more widely produced on an industrial scale<sup>17</sup>. Relative prices for pearl millet tend to be consistently higher than those for maize.

As a result, commercial millers are simply unfamiliar with the processing of sorghum and pearl millet, and sceptical about levels of demand.

During the past few years, ICRISAT has supported Consumer surveys to convince millers Zimbabwe that consumers will accept the taste of sorghum meal. But millers remained averse to risk, especially considering the investments needed in grain cleaning equipment and that relative size of this market remains uncertain. Not enough grain has been available at competitive prices to adequately test this market. And as long as milling throughput remains low, it is difficult to compete with larger-scaled commercial maize millers.

Millers also commonly complain about contamination of their grain with sand and stones<sup>18</sup>, therefore leading to the question of how the project dealt with post-harvest practices.

This combination of problems of grain availability, cleaning, and processing, along with uncertainty regarding consumer demand place sorghum and pearl millet at a distinct disadvantage relative to maize. Furthermore, prices for sorghum and pearl millet are also highly variable, even within the same industry; this could be the result of uncertain availability (in turn, result of low productivity).

As this cooperative dealer and miller supported by the project just begun its marketing activity at the moment of drafting this report, little can be evaluated concerning its wider impact. This analysis focuses on the relevance and design, and – in part – the potential sustainability of the planned benefits of this intervention. From what precedes, there seems little question that large

<sup>&</sup>lt;sup>17</sup> There are many reasons for the dominance of maize, including its higher productivity in higher rainfall zones. Investments in maize production have also been reinforced by historical market supports favouring maize, including price supports, and stockholding arrangements. Overtime, these have encouraged the optimization of maize processing systems. Maize now tends to be more readily available to major millers at prices equal to or less than the price of sorghum.

<sup>&</sup>lt;sup>18</sup> This results from the common practice of threshing the grain on the ground, and then sweeping the threshed product into grain bags destined for the market.

improvements in productivity must still be derived from better crop management. According to Rohrbach(2012), we are left with a "chicken and egg scenario". Farmers have little incentive to adopt yield improving technologies without a consistent, commercial market. However, the development of this market is constrained by the lack of consistent grain supplies.

Taking from the New Institutional Economic theory, this situation can be read as follows: marketing risks and imperfect information in this particular market cause transaction costs, impeding profitable deals to take place. The introduction of the Agri-dealer bears these risks and search costs (meaning the cooperative members are better placed to know who produces most, year-by-year, contrary to outsider traders and middlemen). From the strict economic point of view, the intervention makes sense, under the assumption that the agri-dealer is well managed and current market prices do not become too volatile. Certainly, the agri-dealer can fail, mostly for two reasons: at low yields, per unit transformation costs may arise, driving the operation unprofitable or, drawn by the agri-dealer itself, other traders and millers can buy farmers' production at a more competitive price, crowding the agri-dealer out of business. It this latter scenario, however, the whole intervention would still be successful, because it would have created sustainable marketing links to its beneficiaries, where now are scarce. The former scenario deals with the risk that the production is inconsistent and the consumers' market thin. These represent real possibilities: however, the production stability is one of the potential outcomes of the project. Whether it succeeded (and in all the targeted areas) is a condition to the set-up of the agri-dealer itself, and will be treated later. Market risks, on the other hand, will always exist. The project tried to assess them by commanding a marketing study to the Ministry of Agriculture. This study has been found by the author as lacking essential elements of consumers' demand and preferences, but the observation<sup>19</sup> is that the relative importance of sorghum and pearl millet in rural food systems suggests substantial opportunities should exist for their commercialization. In the first instance, commercial grain milling can provide urban migrants from sorghum or pearl millet production zones with a familiar food product. As incomes rise and food preferences evolve, a growing share of cereal grains will be consumed in processed form. But such foods may still be based on sorghum or pearl millet.

In this regard, the project's small-grain marketing strategy is relevant, because it provides the possibility to farmers to bear the risks of milling and marketing on themselves.

#### **2.3.** Alignment with main policies and strategies

The project's objectives are consistent with Government of Zimbabwe (GoZ) Medium Term Plan, Zimbabwe Agricultural Policy and Zimbabwe Comprehensive African Agriculture Development Programme (CAADP) compact.

It should be emphasised that the project signed a Memorandum of Understanding with the Provincial Ministry of Agriculture for the implementation of the activities.

The intervention was financed – at 80% - by the European Union (EU). The EU has adopted an overall implementation framework called the "Integrated Programme to achieve Sustainable Food Security" (IP-SFS).

This overall objective is to achieve food security by creating an environment that is conducive to reduce the dependency of vulnerable rural households on humanitarian assistance and to sustainably increase resilience to food insecurity. The aim of the EU support in the food security sector is twofold: (i) to achieve sustainable food security of rural households by reducing dependency on humanitarian assistance and (ii) to facilitate the transformation from subsistence farming to more diverse income generating activities and eventually graduating to more commercial types of activity.

The EU also addresses food security challenges in Zimbabwe through 'The Integrated Programme to achieve Food Security (IP-SFS). This programme has the following main areas.

<sup>&</sup>lt;sup>19</sup> The project, however, carried out a second study, drafting the main outline of the demand and consumers' preferences.

- Enable access to essential farm inputs through the local market with open vouchers for crop and livestock producers; and
- Support to sustainable agricultural practices in crop and livestock production, small-scale irrigation and environmental protection (agro forestry).

The intervention is therefore clearly consistent with both components of the EDZ development agenda, because it supports small-scale communal farmers with inputs, using market-based mechanisms (ex. Seed fairs) and it includes the capacity building of extension services as a key result.

#### 2.4 Communities' reception

The mid-term survey assessed in 2012 the reception of beneficiaries. The timing is ideal for assessing whether the intervention was demand-based and in line with people's expectations and needs because it allowed for the activities to start and the context of the intervention was still similar to the situation without the project. 72% of the respondents reported that the farmers' expectations were either always or sometimes solicited, while 18% did not know whether their expectations were solicited. 10% of the respondents reported that the farmers' expectations.

## **3 MAJOR ACTIVITIES AND RESULT WISE ACHIEVEMENTS**

#### 3.1. Targeting

As discussed earlier, the selection of beneficiaries for the DTC component, the irrigation schemes/institutional gardens and the livestock distribution, and, indeed, the target groups are in most cases separate.

#### *3.1.1. Targeting of the DTC component*

The targeting of project's beneficiaries has been carried out at three levels:

- Selection of wards
- Selection of contact farmers
- Selection of training and seeds recipients

<u>Selection of wards.</u> 10 wards were selected according to the following criteria:

- no major donors implementing a similar project in the same ward;
- capacity of the beneficiaries to cultivate the supported crops;
- geographical contiguity (wards to be in clusters so as to reduce operational costs and allow for linkages amongst them);
- existence of Agritex field staff in the ward, as these would assist in providing extension services and backstopping contact farmers.

Once the selection criteria were agreed and accepted by the stakeholders<sup>20</sup> of the intervention, and in collaboration with the districts' Social Services Sub committees, the 10 beneficiary wards were selected. The Rural District Councils ratified and recommended the wards in both districts.

No geographical targeting, apart for the selection of the districts of Hwange and Binga, was undertaken previous the project's inception. This is not necessarily bad, as livelihoods based on rainfed agriculture tend to be dynamic and other development projects may target the area; not targeting the wards allowed the project to target beneficiaries according to the criteria more precisely. This, however, came at a cost of some delays in the inception of activities, later overcome.

<u>Selection of contact farmers.</u> The concept of the contact farmer approach was introduced to all potential beneficiaries as the entry point of the project. The roles of the contact farmer were discussed and agreed upon by the community, who also agreed on the following selection criteria:

- To be willing to share information with other beneficiaries
- To be an early adopter of new innovations
- To have time to attend farmer training sessions and to train others
- To have respect in the community where he/she works
- To be capable of executing some farm work/duties
- To be prepared to participate on the program on voluntary basis
- To have proven farming capabilities

According to field discussions, the community had a strong voice in the selection of contact farmers: in some cases, they seemed to be elected, rather than selected. Although these contact farmers are

<sup>&</sup>lt;sup>20</sup> An inception workshops were held in each of the 10 participating wards where stakeholders were sensitized on the program objectives, donor, processes, implementation strategy to be used as well as the expected results.

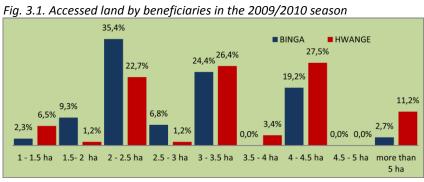
probably the local "champions" and maybe not the typical farmers, this strategy is successful in a number of aspects: as the other beneficiaries (10 to 15) elected the contact farmers, they feel the right to demand extension, in a bottom-top manner; secondly, contact farmers interviewed by the author are aware of this responsibility and seem to feel the incentives to work well on the demonstration plot. Most of the direct training provided by the project focuses on building the capacity of CFs to train others in crop agronomy, conservation farming, and seed multiplication and post-harvest technologies. There was a discrepancy between the foreseen beneficiaries per year and the actual: the project passed the target number during the third year and was not able to reach all the planned beneficiaries in the fourth year, mostly because the potential beneficiaries did not met some basic selection criteria. However, this did not affect the implementation of the activities, nor the achievement of the planned results.

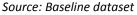
Selection of training and seeds recipients. District stakeholders and the communities were

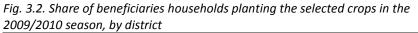
responsible of the selection of 10,000 beneficiaries of the DTC component.

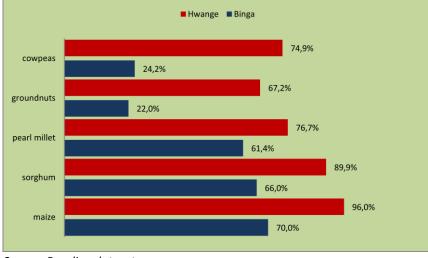
Focus groups held during the evaluation mission included beneficiaries as well as nonbeneficiaries. Nonbeneficiaries actually declared themselves as better-off and appeared to understand and acknowledge the selection criteria as well as the reasons of exclusion. Little or no disagreement has arisen, as the selection was, according to the discussions, fair and transparent.

The project set selection teams per ward<sup>21</sup>, charged with selecting and recording the names of interested farmers who qualify. Village teams then submitted the village lists to the ward level teams, which included the community leaders. This ward level selection team then selected and compiled the final list of beneficiaries<sup>22</sup>,





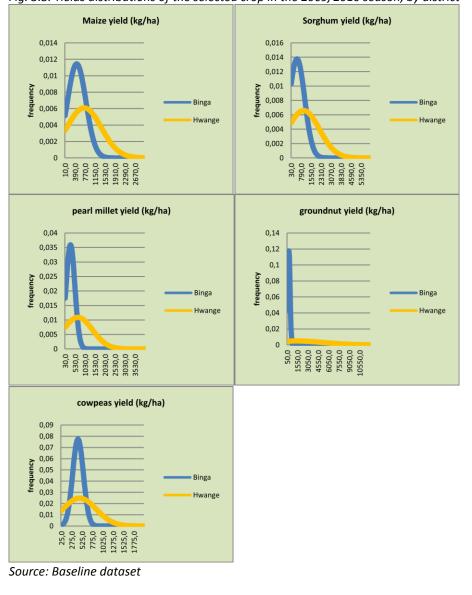




Source: Baseline dataset

<sup>&</sup>lt;sup>21</sup> The stakeholders at the ward level recommended the formation of committees for the beneficiaries' selection, responsible for the vetting and confirmation of village lists and cross checking these village lists with beneficiary lists from other programmes being implemented in the ward.

<sup>&</sup>lt;sup>22</sup> A verification exercise was routinely carried out in all the wards. The beneficiaries were verified through a public gathering attended by all selected beneficiaries, community leaders, Agritex staff and Lead Trust staff. Registration involved interviewing the beneficiary and recording the responses on a beneficiary registration form (BRF). The questions on the BRF pertained to beneficiary characteristics in terms of ability to utilize the program inputs as well as beneficiary vulnerability status. Selected beneficiaries who did not meet the set selection criteria were not registered and were replaced with deserving farmers. The process of replacement was participatory and transparent, involving members of the selection committee and project staff. This was done to ascertain conformity and adherence to the selection criteria and ensure that there are no inclusion errors.



#### Fig. 3.3. Yields distributions of the selected crop in the 2009/2010 season, by district

according to the following criteria:

- Households with access to land for planting (1.1ha)

Households
 with less than 4 cattle
 Households
 with adequate labour
 for planting and
 weeding

- Household able, capable and willing to participate - Households that are not participating in similar

programmes Households chronically with ill, handicapped or disabled members Households taking care of orphans Households headed by women Households headed by elderly (+60) or child (-18) Interestingly, the criteria to benefit from be the project can resumed the by vulnerability to food insecurity, but, still,

not extreme poverty, as beneficiaries are also selected by their ability to farm. A baseline survey was conducted during the first year of the project. It revealed that, accordingly with the selection criteria, all beneficiary households accessed at least one hectare of land. The figures, however, seem more grouped around the mean in Binga, than in Hwange, where the frequency of households at the extremes is higher (Fig. 3.1). Beneficiaries were characterised by farming maize, while small grain occupied a less important extent (85.1% planted maize, 79.9% sorghum and 70.3% pearl millet). Groundnuts and cowpeas were farmed by half of them (48.3 and 53.7%, respectively). Anyway, beneficiaries from the two districts had different cropping pattern: in Binga, the lower shares can be explained by households farming less crops during the same season, in facts 2.44 on average, while 4.05 in Hwange.

This is also reflected in the yields. While in general the targeted area is characterised by low yields, they vary consistently between those of Binga and Hwange. If the peaks of the distributions (Fig. 3.3) are similar (although a little higher in Hwange), the distribution in Hwange is flatter, indicating a higher variation, while in Binga, all beneficiary households harvest, more or less, the same production per hectare.

In conclusion, it seems that, although targeting was undertaken accordingly to the criteria specified,

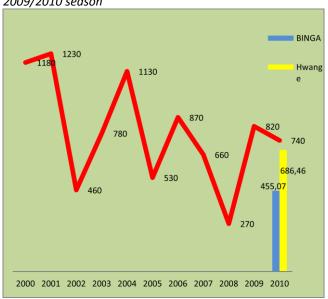
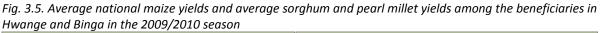


Fig. 3.4. Average national maize yields and average maize yields among the beneficiaries in Hwange and Binga in the 2009/2010 season

the beneficiaries selected in Hwange seem better off than those selected in Binga. One mean of comparison is, in particular, maize yields. In the 2009/2010 season they were lower than the national average (that, itself, has been very variable in the last decades), but particularly in Binga, (Fig. 3.4).

This gap is even more evident in the average sorghum and pearl millet yields (Fig. 3.5): besides yielding more than the national averages (but these figures should be interpreted with caution, because are not rigorously measured and also refer to other agro-climatic regions in Zimbabwe), what surprises is that the yields in Hwange are, on average, the double of those in Binga.





Source: Baseline dataset, FAOSTAT

#### 1.2. targeting irrigation schemes

Beneficiaries of the rehabilitation of the schemes already had the property of the plots before the project. During the project design, a feasibility study conducted by the Department of Irrigation of the ministry of Agriculture recommended the schemes on the basis of rehabilitation costs and number of plot-holders.

#### 3.1.3. targeting poultry distribution

This small group of beneficiaries have been put forward by village committees. From focus group discussions, it seems that non-beneficiaries were aware of the selection criteria, but little is known on whether any vulnerable households opted out of the project for fear of stigma.

Source: Baseline dataset, FAO/WFP (2011)

#### 3.2. Capacity building

New knowledge and skills is a very meaningful change that an intervention can bring on. Indeed, the project staff spent most of its time building capacity among beneficiaries. Specific actions have been implemented by the project in order to train target farmers and raise their capacity and awareness. These include, for the DTC component:

- Training sessions. Sessions were organised along the cropping cycle, to make the topic relevant to the timeframe of the operations. They were also kept of one day or less. For each topic, one session per ward was organised. This arrangement appears to be very effective, but also efficient. Most of the budget used to the creation of the dealer/processing application has been saved from this line. On the negative side, the trainings made little use of visuals and little training material was handed-over to trainees.
- Exchange visits: this activity was introduced following a ROM visit, in 2012. According to beneficiaries, it is a very effective way of learning, in particular after general training sessions.
- Experimental/demonstration plot. The project used this tool extensively<sup>23</sup>. A total of 587 plot • have been set as demonstration to try CA techniques. The target set was 60 plots (6 per wards, but at the end they are 63) but the project also supported smaller demonstration plots managed at contact farmers' level, in order to facilitate showcasing CA practices. Because the adoption of CA has been slower in Binga, this district had a disproportionally lower share of demonstration plots (125, against the 462 in Hwange).
- Cascading. On overall the approach was viewed as an effective tool in disseminating and • cascading training information to other fellow farmers. Contact farmers were said to be frequently available for consultation, conducted frequent monitoring visits and attended ward meetings.

Knowledge and skills acquired by beneficiaries have been tested during focus groups. Even after a long period from the training sessions, the concepts of CA, Planting basins/ ripping (use of ripper tine), manuring, Top dressing, micro- dosing, Weed control, intercropping, rotation, mulching and Climatic & DTC efficiencies have been grasped, but not all applied them altogether to their plots, mainly for lack of inputs<sup>24</sup>: in Binga, where beneficiaries adopted the technology proposed more slowly, lack of manure and mulching was sometimes put forward. As a result, behavioural change (i.e. the adoption of CA) proceeded at a different pace. Some waited to see early adopters' performance in their area or during exchange visits; some only dedicated a small plot to try CA, before adopting it as a practice. The different pace of technology adoption seems to be a recurrent difference between Hwange and Binga. Possible explanations of this phenomenon are the fact that Agritex officer in Binga have a larger area to cover, and therefore are less able to follow-up all project's beneficiaries, but also risk-aversion, given that the conditions of farming and productivity in Binga were less performing when the project started.

30 Agritex Officers have been trained in seed production techniques and agronomy of drought tolerant crops.

During the training sessions, awareness sessions were also conducted, under the supervision of Lubhancho House. Topics covered were:

- HIV definition, causes, transmission and prevention
- Nutrition and its importance, and •

<sup>&</sup>lt;sup>23</sup> The demo plots were set according to FAO standards and consist of at least 4 treatments, based on comparing basins and or rip lines, against farmer's conventional practice, with manure versus micro-dosing with fertilizer and seed varietal demonstrations. The total area per plot under each treatment was set as 50 m by 20 m. <sup>24</sup> Most beneficiaries, however, practiced either one of the minimum soil disturbance conservation farming principles (basins and ripper

tine). During the course of the project, more and more beneficiaries adopted CA techniques.

#### • Crops and their use in the body

Pre- and post-tests were used to evaluate retention of these sessions. In general, retention was better for nutrition, rather than HIV, but post-test scores, even after months from the trainings, was usually high (95-100%) with only some villages that scored low (75-85%) and lower than pre-tests. Among the challenges encountered by Lubhancho House to carry out these sessions was the short period (two months) to reach of the beneficiaries. Had Lubhancho House more resources (human, logistic), a more rational and extended coverage could have been reached. Anyway, although no official data can be exploited to assess the effect of these sessions, informants among the health staff of Lukunguni and St. Patrick Hospitals reported that the trend is improving and stigma less common<sup>25</sup>.

Beneficiaries from irrigation schemes, some staff working for the institutional gardens supported and Agritex officers have been trained in horticulture and agronomy. They also received advice on nursery management, planting, fertility management, harvesting and irrigation water scheduling. The irrigation management committees had their negotiating, managing and conflict resolving skills improved through leadership trainings that were conducted for each scheme.

For the poultry component, all beneficiary households were targeted for two-day livestock management training and also received their training through cascading by 30 trained contact farmers.

#### **3.3 Drought-tolerant crops**

The technological package introduced consisted in using CA technology, in combination of seeds of sorghum, pearl millet, groundnuts and cowpeas and some (25 Kg) fertilisation<sup>26</sup>. Of course, this was coupled with capacity building mentioned in the previous section.

From project, backstopping and ROM reports, these activities have been implemented in quantity and quality expected, but flexibility has been exercised, too: after the donor's request, the project did not buy new stocks of seeds as planned, but purchased extra-contingencies seeds for cereals from project-supported seeds producers. Therefore, the project only bough twice, the second time from the Foundation Seed Producers.

The first procurement of seeds was not delivered according to the specification required and this delayed the achievement of the planned results (as a recall "Drought tolerant crop seed loans distributed to 10,000 vulnerable households over a 4 years period, enabling beneficiaries to develop sustainable seed systems and produce 30,000 MT of cereals and 1,750 MT of legumes"), but overall did not jeopardized it and the production of small grains went well beyond the target: in the 2013/2014 campaign, the sampled farmers <u>alone</u> harvested 33,000 MT of cereals. The total production of pulses however, is estimated at 640 MT for the same season. This is probably due to the decrease in the area grown for cowpeas and groundnuts across the two districts. This is in contrary to the fact that the project was promoting the two crops to enhance crop diversity and add diversity to the diets of the households through inclusion of pulses.

Part of the challenges encountered by beneficiaries, as reported by focus groups were the same encountered by the Mid-Term Evaluation mission, in 2012: pest and disease (including animals) were a problem as they destroyed their fields: fencing plots came at a cost and is a constraint for expanding the planting areas. Late planting and lack of fertiliser was also a challenge faced as most farmers waited for the effective rains to start: lack of manure and mulching was also reported, along this line. Inadequate or erratic rainfalls appeared to be less of a problem, compared to 2012, possibly due to recent good rainfalls, CA techniques, or both.

<sup>&</sup>lt;sup>25</sup> This can be the combination of other interventions; furthermore, no information on these trends in Binga was available.

<sup>&</sup>lt;sup>26</sup> Tools and other hardware have also been distributed as prizes during the agricultural shows.

#### 3.4 Seeds production and pass-on

Against the 100 planned, 82 farmers consistently produce quality seed which has been tested and approved by research institutions and seed companies. Individual performances varied, but most stabilised at 200-300 Kg of seeds each, for both sorghum and pearl millet. Sales of seeds went through seed fairs, but also to other neighbouring farmers. In general, seeds are recognised of good quality and most of foundation farmers benefit from selling their seeds at premium. Some farmers in Binga, interviewed during a ROM mission in 2013, did not seem to be aware of the degeneration of genetic material and purchased grains as seeds. This, however, was not found by the impact evaluation, signalling that a communication effort was undertaken by the project staff to extend the added value of quality seeds.

In general, seeds' repayment rate was lower than expected, even if the project adopted incentives<sup>27</sup>. Seeds repayments also stopped some farmers to register as beneficiaries because they were reportedly reluctant to pay back seeds<sup>28</sup>. Poor rainfalls also played a role in beneficiaries' ability to pass-on. The final repayment figures in 2013 were 61% sorghum, 56% pearl millet, 12% groundnuts and 10% cowpeas.

#### 3.5 Irrigation schemes and institutional gardens

The purpose of the irrigation schemes is to allow beneficiaries households whose land was expropriated during the building to benefit from irrigated crops.

The purpose of gardens is to equip the selected not-for-profit institutions (hospitals and orphanage) with a sustainable source of fresh vegetables for their feeding programmes.

Although different in purpose, the two interventions share common activities for their achievement and a set of common technical indicators for their evaluation; they are therefore treated together in this section.

Results-wise, the achievements on the irrigation schemes have been impressive, considering the state of these infrastructures before the intervention: broken dams, leaking pipelines, weed and algae proliferation that reduce the conservation capacity by up to 70% (according to the feasibility study undertaken by the Department of Irrigation), embankments, failing distributions structures are just some of the frequently cited problems that made the schemes abandoned. The project had to invest on the rehabilitation works massively.

The institutional gardens were, in terms of hydraulic engineering, an easier task, but all have been equipped with pump, elevated reservoir and drip irrigation system. A water decanter, nevertheless, was not considered in the design and as a result, drippers are occasionally obstructed.

Because of the limited time, irrigation schemes were evaluated on the basis of a questionnaire designed to assess their economic impact. Only 2 irrigation schemes and 2 institutional gardens, deliberately chosen at the extremes of the range in economic performance were visited. The sample included Chentali and Navuzende for the irrigation schemes, and St. Patrick Hospital and Good Hope Mother for the institutional gardens.

The visited schemes were assessed based on agronomic, economic, water-use and physical indicators. The purpose of this section is to highlight the differences in the implementation of activities and, in general, on the functioning of the schemes but these indicators will be later considered again, trying to explain the differences in returns to beneficiaries.

<sup>&</sup>lt;sup>27</sup> Farmers that failed to repay previous seed loan were not going to be considered for the program in the next season.

<sup>&</sup>lt;sup>28</sup> Or did not want to risk engaging for failing to re-pay.

Agronomic indicators show a difference between in output in terms of monetary benefits (USD/m<sup>3</sup> of water applied) but in terms of productivity (Kg produce/ m<sup>3</sup> of water applied) and irrigation efficiency the schemes are similar (easily assessed because all the schemes operate by gravity and water is distributed to the plots via siphons).

All irrigation fees are collected, and the management committees of both schemes claim an impressive 100% effectiveness of fee collection, used for yearly maintenance and operation expenditure. Fee nominations are different (almost non-existent in Chentali, 1 USD per holder per month in Navuzenda) and do not appear to be consistent with the size and the number of plots; anyway, committees declared having enough in treasury for maintenance and minor repairs.

Because productivity-to-water and crops produced are similar in the two schemes, water use performance is also similar: deep percolation and seepage losses are not evident.

The total Irrigation supply (m<sup>3</sup>), i.e. the surface diversions and net groundwater drafts for irrigation could not be evaluated.

#### 3.6. Activities targeting HIV/AIDS affected

A 4-hen package was distributed to 150 particularly vulnerable households, like persons living with HIV, orphans and widows. This activity was undertaken during the first year of the project only. A focus group guided the conclusion that the beneficiaries' diet improved very much in protein, because a weekly consumption of 7 chicken /week was often reported. Beneficiaries present at the focus group had from 10 to 25 animals at the moment, but some sold their chicken to buy other animals, like cows or goats<sup>29</sup>. Feeding was said to be not a major problem, although it was recognised that most successful beneficiaries fed their animals more. Most productive households also seem more familiar with planned mating (chicks are regularly put aside at 2 weeks, the hen left to mate with the cock again). The project, therefore, was successful in achieving the result of a sustainably diversified diet. On the negative side, two issues are worth noting: a Newcastle disease epidemic in the area threats the stock and veterinary centres are sometimes far to reach. No improvements are brought by the project on the dens: yet, with meshes applied to dens, poultry would have been better protected from wild animals.

<sup>&</sup>lt;sup>29</sup> Marketing appear to be a very good prospects, because poultry are not common in the area; beneficiaries seemed to have established good marketing linkages on their own, and some have a reputation for selling chickens to other villages.

## **4 IMPACT EVALUATION**

The evaluation makes use of the indicators stated in the LF: they should be distinguished between those measuring the specific and overall objectives. The specific objective is supposedly a direct effect of the intervention, while the achievement of the overall objective depends on other variables, characteristics and conjunctures that are out of the project's control but to which it is supposed to contribute. This section treats the project's indicators as topics, while specifying which ones are related to the specific or overall objectives.

#### 4.1 Yields

During the duration of the project, yields have increased. The average yields in Binga and Hwange, before and after the project, are presented in Tab. 4.1. Hwange still enjoys highest average yields, but the percentage increase of the 2013/14 harvest, compared to the 2009/10, is higher in Binga,

	Before				% av	verage
			After		increase	
	Binga	Hwange	Binga	Hwange	Binga	Hwange
maize	455,07	686,46	896,55	937,63	97%	37%
sorghum	374,97	614,87	676,88	808,68	81%	32%
pearl millet	285,86	524,46	670,65	741,25	135%	41%
groundnuts	263,11	545,93	381,85	564,29	45%	3%
cowpeas	413,01	413,69	694,15	755,35	68%	83%

Tab. 4.1. Average yields (kg/ha) and percentage increases by district

where average yields were particularly poor before the project<sup>30</sup>. This is even more striking when compared with the average yields of the control groups: for Binga, maize only 66.6, sorghum 99.1, pearl millet 365.8 Kg/ha. No

pulses were harvested by the control group in Binga. In Hwange, the non-beneficiaries yielded on average 641.3 of maize, 702.8 of sorghum, 611.2 of pearl millet, 544 of groundnuts and 617.9 Kg/ha of cowpeas. Therefore, when compared with the control group, achievements in Binga result even more spectacular.

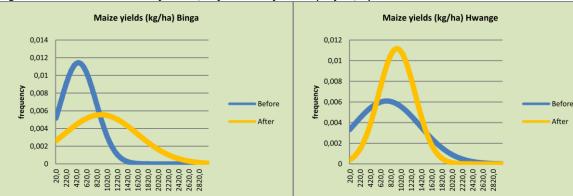


Fig. 2.1. Yields' distributions of maize, before and after the project, by district

<sup>&</sup>lt;sup>30</sup> Yields of 600 Kg/ha for sorghum are considered normal in these conditions, while pearl millet is reported to yield up to 800 kg/ha, but with higher plant density (80,000 plants/ha).

The project target of 20% increase has been largely achieved for all crops, with exception of groundnuts in Hwange.

An important feature is the distribution of yields, not just the averages. Maize yields have an interesting feature (Fig. 2.1): in Binga, before the project, the distribution showed less variation than in Hwange, where more "extreme" yields were more frequent. The opposite seems to have happened during the last harvest: while in Hwange, the distribution is more homogeneous around the average, in Binga the increase in average yield is due to a relatively small share of beneficiaries performing particularly well, while the frequency of those yielding at similar levels than in 2010 is still important, about 23%.

It must be stressed, however, that maize was not a crop supported by the project and these increases can be considered as a spill over. Nevertheless, this phenomenon of "fat tails" in the Binga yields distribution is also shown for sorghum (although to a lesser extent than for maize), while in Hwange the standard deviation is similar to the "before" levels (Fig. 2.2).

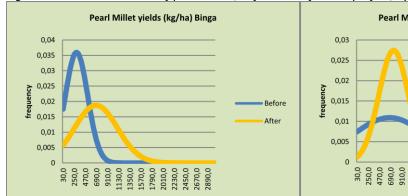
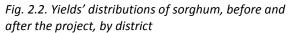
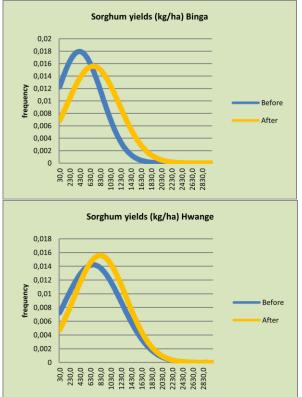
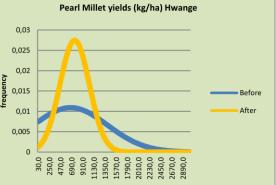


Fig. 2.3. Yields' distributions of pearl millet, before and after the project, by district







Pearl millet is where most improvements are found in both districts, but particularly in Binga (Fig. 2.3). Even for this crop, the new distribution is flatter than that of 2010, but the share of farmers yielding less than the average before the project is only 5%.

Yields for pulses also varied greatly, except for the groundnuts in Hwange (Fig. 2.4).

The relationship between area cropped and yields seems to be inverse, with the exception of maize, which has growing yields as the area grows (Fig. 2.5): in other words, it seems that the smaller the plot, the highest the yields; this can be attributed to the highest farming intensity and it is consistent with the limitations of expansion of CA due to inputs constraints.

In general, areas varied little, compared to 2009; for maize and sorghum, they even decreased.

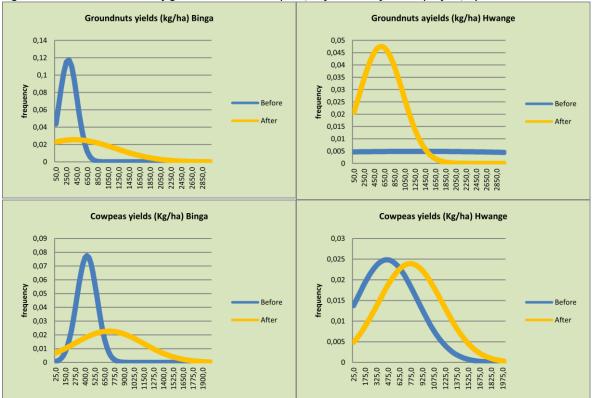


Fig. 2.4. Yields' distributions of groundnuts and cowpeas, before and after the project, by district

Despite the introduction of ripper and the beneficiaries' recognition of the advantage of the tool to farm more, constraints persist to the increase of cropped area, especially under CA. Some explanations have been put forward during focus groups' discussions:

- Difficulties to find manure and mulching: as the technological package introduced by the project prescribes the simultaneous application of these inputs, one limits the application of others.
- Weeding has become more Labour-intensive
- More land cropped needs more fencing, or the risks of crops being eaten by livestock increases.

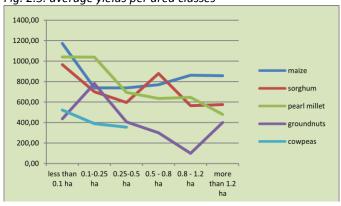
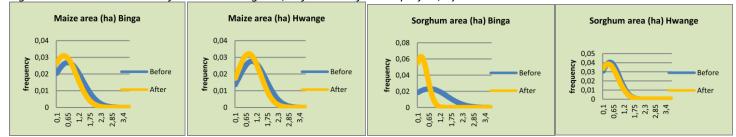
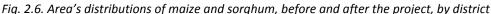


Fig. 2.5. average yields per area classes





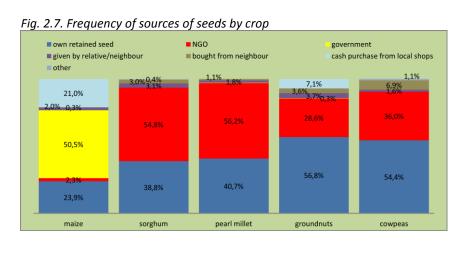
A table of average cropped areas summarises well (Tab. 2.2). An impact of the introduction of CA seems to have been the reduction of the area dedicated to maize and an increase of the area dedicated to pearl millet. While it is not possible to analyse this

trend in the control group, the areas

Tab. 2.2. Summary of average areas cropped by crop and district (ha)

	before		after		Control	
	Binga	Hwange	Binga	Hwange	Binga	Hwange
maize	.62	.92	.43	.76	.18	.29
sorghum	.65	.43	.23	.34	.28	.27
pearl millet	.8	.5	1.19	.37	1.45	.11
groundnuts	.03	.14	.07	.12	0	.02
cowpeas	.03	.16	.05	.11	0	.02

dedicated to these crops by non-beneficiaries are smaller, even compared with the situation of beneficiaries before the project, with the notable exception of pearl millet in Binga. This could be the

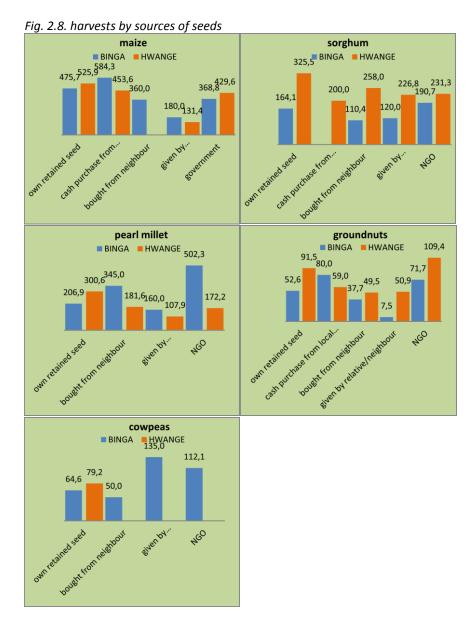


result of the targeting, biased towards land possession and ability to farm it.

The project, as a source of seeds, is of course important for all crops (except maize), but own retained seeds, including those multiplied from the seeds distributions, are also frequent (Fig. 2.7). However, in the

control group, the only sources of seeds are the own retained seeds and those given by a relative or neighbour.

Seeds fairs, despite the enthusiasm generated among the seeds producers are still not used to



source seeds among beneficiaries, the main clients being farmers mainly from other districts.

Yields are significantly lower when the source is local shops, probably because the new varieties have not yet penetrated the seeds' market. For millet, the seeds source does not seem to have and influence in Hwange, but in Binga, where the variation among yields is higher, the difference marked. is Anyway, because areas did not change much and the source of seeds is dependent on the total area farmers want to crop, it is more interesting to cross the source with total crops production (Fig. 2.8). For maize, harvests are similar, with the seeds exception of given by relatives and neighbours, in both districts, which gave low levels of production, presumably

also because quantities sourced were small and therefore area cropped were limited. For sorghum, harvests from own retained seeds, as well as from neighbours, have been particularly rich. Harvests from seeds from the project have been richer in Binga, because larger was the area cropped.

To pulses, beneficiaries dedicated smaller crops, but the source of seeds does not seems to play a role: highest production levels were recorded for the seeds distributed by the project for groundnuts, but also the own retained seeds, often second or third generation of project-distributed seeds. For cowpeas, the only source recorded in Hwange is the own retained seeds.

Data from the mid-term evaluation (undertaken in 2012) can be used to assess the relative importance of CA practices relative to new seeds' varieties: the survey, in facts, distinguished between plots using CA techniques and the source of seeds<sup>31</sup>.

<sup>&</sup>lt;sup>31</sup> With four possibilities: CA and project's seeds, CA and other seeds, no CA and project's seeds, and no CA and other seeds.

For Sorghum, but with similar results on the other crops, it is clear that the combination of CA and the use of the seeds distributed by the project gives the highest yields (Fig. 2.9), in both districts. In plots where the CA techniques were not applied, yields are similar; where CA was applied, but other seeds were used, yields resulted the lowest,

but the difference is not statistically significant (p value > 0.05). Similar results were obtained for the other crops, with major а difference that in Binga: vields of pulses under CA were similar to the ones with traditional farming. The project staff reported that the farmers in Binga have been slower to implement all the CA practices in the prescribed way, and this may have resulted in similar yields. In turn, this may have affected the (reportedly late) adoption of the technology.

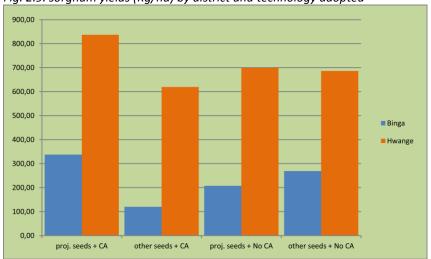
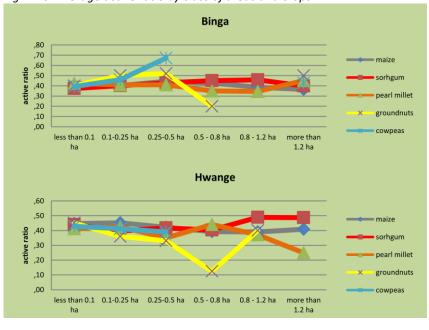


Fig. 2.10. Average active ratio by class of areas and crops



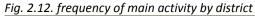
Households' characteristics, and in particular the labour available was supposed to have an important influence on the area cropped and therefore on the production obtained, especially

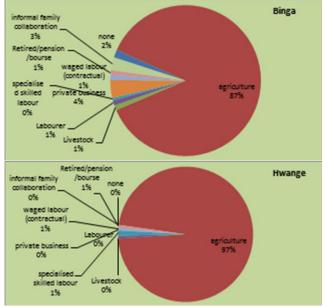
*Fig. 2.11. frequency of households having three (or more), two or one activities, by district* 



because CA techniques are more labour intensive.

Fig. 2.9. sorghum yields (Kg/ha) by district and technology adopted





Tab. 2.3. frequency of secondary and tertiary activities by district

	seconda	ary activity	tertiary activity				
	Binga	Hwange	Binga	Hwange			
none	6%	7%	21%	41%			
agriculture	6%	4%	1%	0%			
Livestock	43%	38%	10%	5%			
Fishing	3%	4%	2%	3%			
Labourer	23%	11%	43%	13%			
specialised skilled labour	0%	8%	0%	4%			
private business	12%	5%	4%	16%			
waged labour (contractual)	4%	13%	2%	1%			
Retired/pension/bourse	0%	3%	1%	1%			
transporter	0%	1%	0%	0%			
informal family collaboration	3%	1%	3%	10%			
Other	0%	5%	14%	5%			

The active ration (the share of household's members aged between 18 and 59, on the total household size) varies little as the area increases (Fig. 2.10), with the exception of sorghum. A possible explanation is given by another important characteristic, the livelihood strategies, in particular the activities representing the main contribution to the households and its mean of living. The survey recorded the three main activities present in the household and their contribution in terms of resources. Most households have a main, a secondary and a tertiary activity, but there is an evident difference between the two districts: Binga has more

> diversified livelihood strategies (Fig. 2.12). Agriculture certainly represents the most important activity in both districts, but it is less undertaken in Binga (87%) than in Hwange (97%), as main. In Binga, other activities are more frequent than in Hwange, like the informal family collaboration, remittances, labourer, private business and to a lesser extent - livestock (in particular as secondary or

tertiary activity). In Hwange, a higher share of beneficiaries has specialised skilled labour and waged labour as secondary and tertiary activity (Fig. 2.12 and Tab. 2.3).

This distinction is relevant because it can explain why not all household's members' labour is used in agriculture, even if labour shortage is cited as a limitation. Furthermore, it also shows a higher degree of specialisation in agriculture in the district of Hwange.

Animals are a key part of traditional farming system and have a role in its productivity. Livestock may be an assets for farming as well as a diversion: livestock provides traction force (if the household also has a ripper) and manure, but at the same time, the bigger the stock, the more attention it requires,

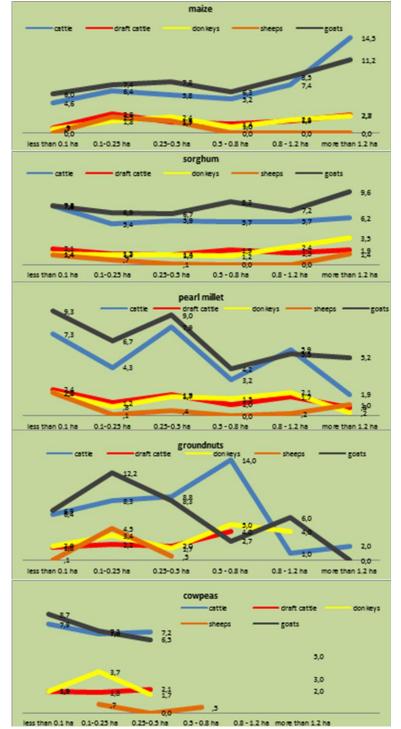
driving available resources like labour away from farming and the more fodder is needed (therefore decreasing the availability of mulch).

From the data of the survey, livestock is more an asset than a liability from farming, although not for all crops in the same measure. Furthermore, some species are probably more important than other (Fig. 2.13). For maize and sorghum, all stocks increase as the areas cropped increase, but for sorghum this is less marked. For pearl millet, the stock of large animals (cattle and donkeys) does not vary much with the areas, while small ruminants (goats and sheeps) decrease as plots are larger. For the pulses, a clear trend is difficult to detect, especially for cowpeas, certainly due to the fact that these crops are less common and, when present, are more a complement to the main crops than real enterprises.

Total grain production, however, is strongly correlated with the livestock heads (Tab. 2.4), in particular cattle,

*Tab. 2.4. correlation between size of livestock and total grain production* 

ana total grain production							
goats	Pearson Correlation	.212**					
	Sig. (2-tailed)	.000					
	Ν	6543					
sheeps	Pearson Correlation	.170**					
	Sig. (2-tailed)	.000					
	Ν	3217					
donkeys	Pearson Correlation	.320**					
	Sig. (2-tailed)	.000					
	Ν	4151					
Draft cattle	Pearson Correlation	.291**					
	Sig. (2-tailed)	.000					
	Ν	5916					
cattle	Pearson Correlation	.483					
	Sig. (2-tailed)	.000					
	Ν	6498					



*Fig. 2.13. possession of livestock by area classes (average number of heads)* 

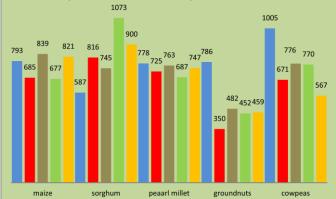
but all two-tailed correlations are statistically significant at p<0.001.

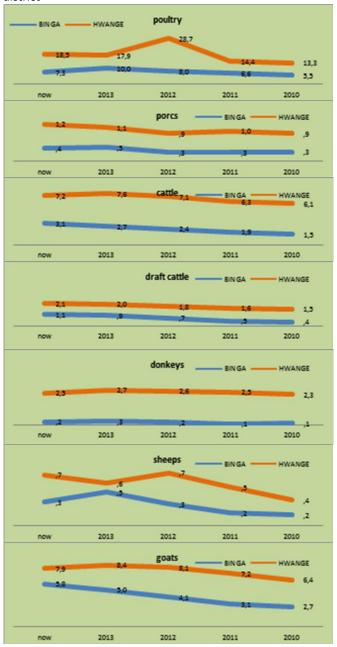
Of course, although a relationship between farming and livestock keeping exists, it is difficult to attribute a cause-effect feature: areas may become larger because more animals are available to draft and to provide manure, but also the reverse can be true, i.e. more animals may be kept because more crop production can sustain them. Furthermore, livestock size is seasonal<sup>32</sup>.

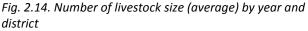
Since the inception of the project the stock of animals increased (Fig. 2.14), with some differences between the two target districts. The finding of larger stocks in Hwange is surprising, given that a higher share of households in engaged in livestock keeping in Binga<sup>33</sup>.

The effects of soil fertilisation method on yields are difficult to detect: there is no clear advantage in using chemical fertilizer or manure (Fig. 2.15)). This is probably due to the fact that these inputs are not applied at the recommended doses, but based on their availability.









<sup>&</sup>lt;sup>32</sup> Nevertheless, the period of the data collection, October, is proven right to speculate on this relationship, because the farming season starts in November.

<sup>&</sup>lt;sup>33</sup> This could be not the effect of the project, because even in the control groups, livestock increased during the past 4 years. Nevertheless, this increase is less marked in both districts, with negative trends for poultry and cattle and small ruminants (only in Hwange).

The marketing pattern (i.e. the choice of marketing channel per crop) remained almost unvaried, compared to the 2009/10 season (Fig. 2.16). The majority of farmers did not sell their product, or sold to other fellow farmers. Nevertheless, most focus groups' respondents declared waiting for the new cooperative agri-dealer processor to begin its activities to sale; therefore, these figures must be considered with caution, because for at least 1,000 beneficiaries, the marketing season is still to begin. This is especially evident in Hwange, where the share of beneficiaries that have already sold part of their harvest is less than four years ago, although their production increased (Fig. 2.17). In Binga, it is worth noting that this share is already higher than in 2010. Among the farmers in the control group, these share are very closed to 0, and the share of production sold ranges from 2.2% for maize to 1.2% for sorghum and pearl millet (in Hwange; in Binga the only production sold was pearl millet, 1.2%). Pulses have not been sold at all.

## Fig. 2.16. marketing pattern per district

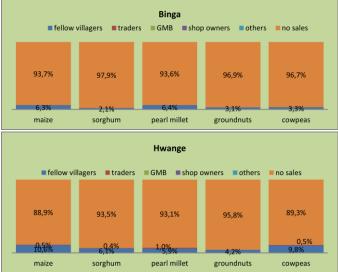
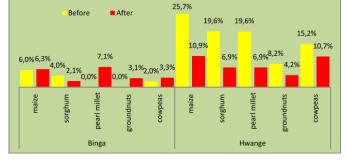


Fig. 2.17. Share of farmers having sold products by district



Sales among beneficiaries are however low: among those who sold some of the harvest, most sold less than 15%, with the exception of pearl millet (22%) and the pulses (40%). But there are important differences between the two target districts. Among those who entered the market, farmers in Binga sells proportionally more Sorghum and pulses than those in Hwange (Tab. 2.5).

There is a relationship between marketing and production, and in particular the choice of marketing channel. As seen before, there are not many options available, but for more important harvests, the sale to fellow farmers is frequently associated. This can be due to the fact that farmers, having harvested a surplus, seek the most ready available buyer, but also the opposite can be true. Selling in "informal"<sup>34</sup> markets can represent an incentive to production, even if it is less lucrative, because it takes place in the production zones, as

opposed to other consumption zones, but one should also consider transaction costs: these are the costs of finding information on buyers (for farmers this means finding the traders), on sellers (for traders, this are the market research costs), monitoring quality and the arrangements' enforcements and all risks involved in transactions. Informal marketing may be less lucrative in terms of cash exchanged, but they are perfectly rational in minimizing transaction costs with established "rules" of

Tab. 2.5. Share of sales among
farmers entering the market by
district

aistillet		
	BINGA	HWANGE
maize	11,6%	28,6%
sorghum	46,0%	28,4%
pearl millet	17,1%	32,7%
groundnuts	65,7%	36,0%
cowpeas	54,4%	39,6%

<sup>&</sup>lt;sup>34</sup> It is called so the marketing exchanging with other goods, future seeds and with other farmers.

the market (prices are well known and one's reputation is a social asset). A notable exception is sorghum. When the surplus is large, traders are the main buyers: the individual quantities sold to fellow farmers, in fact, is on average less than half those sold to traders.

## 4.2 Livestock

All stocks increased in the target areas since the inception of the project (Fig. 2.16). Livestock is more common in Hwange, as mentioned earlier. Poultry (including guinea fowls) being the easiest animal to maintain, is also the most common. The averages increased from 5 to 13 in Binga and from 13 to 18.5 in Hwange. From focus group discussions, it resulted that often, when the poultry stock reaches 25, people invest in larger animals. This can explain why larger animals are more frequent in Hwange, where the poutry stock size is larger. In facts, among the small ruminants, sheeps were not kept at all by the target groups before the projects, while now some stock is available. Goats are however more common, and passed from an average of 1 to 5.8 in Binga and from 2 to 7.9 in Hwange. Larger animals also increased in terms of average heads: cattle passed from 2 to 3.1 in Binga and from 4 to 7.2 in Hwange. Donkeys and draft cattle showed a less market increase in the last 4 years. The 20% target increased has been achieved.

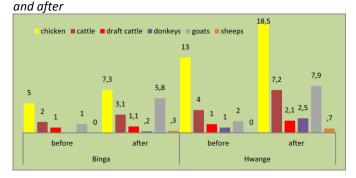
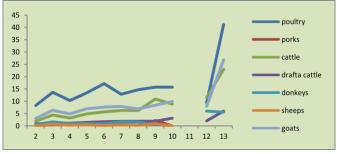


Fig. 2.16. Average livestock by species and district, before

Fig. 2.17. Average livestock by household size



The household size, found as little relevant for crop yields, seems conversely an important factor on the livestock size. As the household size increases, so do the animals owned (Fig. 2.17), although not much for porks and sheeps, which are less common. It is interesting to note that, despite this relationship between the size of the household and the livestock, and despite a strong correlation between livestock and crops production, the household size has a weak correlation with grains production<sup>35</sup>.

A key to understanding the adoption dynamics of CA practices is the distinction between contact farmers and the other beneficiaries. Contacts farmers, in facts, performed significately better than the others, in terms of animal husbandry and yields (Fig. 2.18). This is logical, considering that they



Fig. 2.18. Comparison between contact farmers' and other beneficiaries' livestock size (left) and crop yields (right)

<sup>35</sup> 0.18, but significant at p<0.01 (2-tailed).

have been selected among the most capable community members and benefitted from on-hand project's assistance.

Contact farmers have the double or more animals than the others (exception made for sheeps) and yield about 100 Kg more, per ha, than the others (with the exception of cowpeas). A relevant question for the sustainability of the project's impact is the effectiveness of passing on the knowledge acquired through the project. Tab. 2.6 shows this percentage difference by district (animal species that have less importance to the yields are omitted): while in general, all contact farmers perform better, the difference is quite striking in Binga. In this district, one can make two hypothesis to explain these findings: the transfer of the technological package from contact farmers to beneficiaries is less effective or/and the other beneficiaries are late adopters of the technology. While both are plausible, even the two together, in the opinion of the evaluator, after focus groups' dicussions, is that the latter is probably the most important explanation, also considering Tab. 2.6. % difference of livestock size and crops yields of contact farmers, compared with other beneficiaries. by district

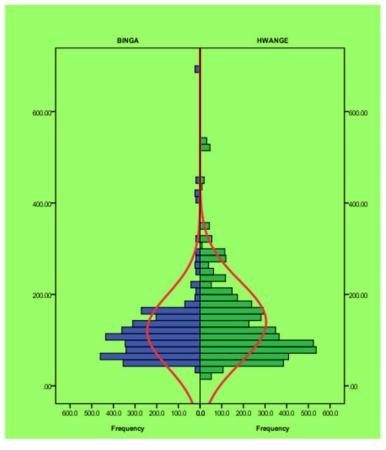
	Binga	Hwange					
crop yields (kg/ha)							
maize	43,7%	5,3%					
sorghum	74,5%	4,8%					
pearl millet	27,2%	0,8%					
groundnuts	82,5%	7,1%					
cowpeas	9,1%	-12,7%					
Livestock size (heads)							
cattle	96,4%	101,5%					
draft cattle	103,2%	12,5%					
goats	74,5%	0,7%					

that at the beginning of the project, farmers in Binga have little resources and a risk-aversion behaviour vis-à-vis new technologies can be taken into account.

#### 4.3 Incomes

Incomes are comparable: the means are 120.48 and 139.21 USD/month for, respectively, the districts of Binga and Hwange. The distributions are shown in Fig. 2.18. In Hwange the share of higher incomes is larger, but only slightly. Because income was not collected during the baseline survey, it is difficult to speculate on its evolution, and in particular whether the project target, of 20% is achieved. increase, lt is, nevertheless, useful to compare these findings with those from the control group and to construct an index as a proxy of wealth. The average of incomes among the control group is 115.83 USD/month in Binga and 103.8 in Hwange, but with a different distribution, skewed towards the left: in other words, the majority of households have an income much below these averages and only 40% of them have an income of more than the district's average.

#### Fig. 2.18. Frequency distribution of incomes, by district



By using the Principal Component Analysis it is possible to reduce the dimensions of the evaluation into a single index, based on the possession of selected items (radio, mobile phone, plough, etc.). Because the questionnaire asked whether the household interviewed had the items now and four years ago, it is possible to construct and compare two wealth indexes (WIs), i.e. one for before the

project and one after. The Wealth Index (WI) is constructed using binary dummies on the possession of some items and on the possession of a certain number of animals, depending on the species. The linear combination that explains the maximum amount of variation is called principal component<sup>36</sup>: dimensions are reduced to optimise the analysis. At the end, the dummies retained are the possession of a plough, a harrow, a barrow, a chart, more than 2 draft cattle and more than 18 chickens. The advantages of using such an index are that (a) it can be compared to the baseline and (b) it has a robust correlation (.4) with income.

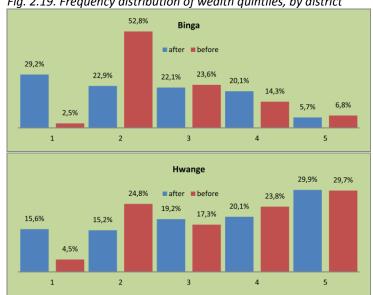


Fig. 2.19. Frequency distribution of wealth quintiles, by district

The percentage increase in the index,

between the inception and after the project is, for both districts, 19%. An interesting effect seems to have been a certain flattening of wealth differences among the beneficiaries, as shown in Fig. 2.19 with the frequency of wealth quintiles before and after the project, by district.

Are these effects of the projects and the drought-tolerant crops, in particular? The correlation matrix in Tab. 2.7 shows a strong positive correlation between the income and the share of maize and pearl millet sold, while the correlation with the share of sorghum sold is less robust. It also shows that there is a strong negative correlation with the share of groundnuts sold. In turn, the share of maize sold has strong correlation with the share of sorghum and pearl millet sold (presumably because the increase in maize production is a spill-over of the CA techniques applied to these crops). Total grains production is also correlated with yields, as seen, a proven effect of the project. Therefore, even if correlation is not causation, it is very likely that the increase in income is caused by the increase in productivity and marketing of drought-tolerant crops. A note apart is worth for pulses, as they seem to have contributed little to households' income: on the contrary, the share sold and production is associated with lower income levels. Smaller areas are dedicated to and fewer other inputs are usually invested in these crops. It is possible that the marketing circuits for the pulses are less developed, even for informal markets. As a result, they are characterised by an orientation towards self-subsistence and less on sales.

<sup>&</sup>lt;sup>36</sup> The procedure involves replacing a set of correlated variables with a set of uncorrelated 'principal components' which represent unobserved characteristics of the population. The principal components are linear combinations of the original variables; the weights are derived from the correlation matrix of the data. The first principal component explains the largest proportion of the total variance.

Income Pearson Sig. (2-ta % maize sold Pearson Sig. (2-ta % sorgh. sold Pearson Sig. (2-ta % millet sold Pearson Sig. (2-ta % c/peas sold Pearson Sig. (2-ta % c/peas sold Pearson Sig. (2-ta % c/peas sold Pearson Sig. (2-ta Maize yield Pearson Sig. (2-ta p/millet yield Pearson Sig. (2-ta Pearson	iled) corr .414* iled) ,000 corr .159* iled) ,001 corr .492* iled) ,000 corr .488* iled) ,000 corr .117* iled) ,004	.414**           ,000           1           .717**           ,000           .565**           .000           .565**           .000           .804**           .000           .461**           .000	% sorghu m sold .159" ,001 .717" ,000 1 .911" ,000 0,000 1,000 .104 ,239	pearl millet sold .492" ,000 .565" ,000 .911" ,000 -1.00" ,000 764"	ground nuts sold 488** ,000 804** ,000 0,000 1,000 -1.00** ,000 1 .000 1 .364**	% cowpe as sold .117** ,004 .461** ,000 .104 .239 764** ,000 .364** ,000	Total grains prod. .238** .000 .166** .000 ,038 .445 110** .288** .000	Maize yield 059** ,000 .087* ,035 222** ,000 146** ,001 .299** ,000	Sorghu m Yield .082** ,000 264** ,000 378** ,000 .163** ,002 -,115 ,073	pearl millet yield 063** ,000 .146** ,000 122* ,049 135** ,001 .292** ,000	ground nuts yield .180** ,000 ,045 ,321 -,016 ,805 338** ,000 .440** ,000	cowpeas yield .111** ,000 .477** ,000 .331** ,000 .677** ,000 256** ,000		
Sig. (2-ta         % maize sold       Pearson         Sig. (2-ta         % sorgh. sold       Pearson         Sig. (2-ta         % sorgh. sold       Pearson         Sig. (2-ta         % millet sold       Pearson         Sig. (2-ta         % g/nuts sold       Pearson         Sig. (2-ta         % c/peas sold       Pearson         Sig. (2-ta         % c/peas sold       Pearson         Sig. (2-ta         Maize yield       Pearson         Sorghum Yield       Pearson         Sig. (2-ta         Pomillet yield       Pearson	corr         .414*           illed)         .000           corr         .414*           illed)         .000           corr         .159*           illed)         .000           corr         .492*           illed)         .000           corr         .488*           illed)         .000           corr         .188*           illed)         .000           corr         .117*           illed)         .004	<ul> <li>sold</li> <li>.414"</li> <li>,000</li> <li>1</li> <li>.717"</li> <li>,000</li> <li>.717"</li> <li>.700</li> <li>.665"</li> <li>.000</li> <li>.804"</li> <li>.000</li> <li>.461"</li> <li>.000</li> </ul>	m sold .159** ,001 .717** ,000 1 .000 0,000 1,000 ,104	sold .492" ,000 .565" ,000 .911" ,000 1 -1.00" ,000 764"	sold 488** ,000 804** ,000 0,000 1,000 -1.00** ,000 1 .364**	as sold .117** ,004 .461** ,000 .104 .239 764** ,000 .364** ,000	prod. .238** ,000 .166** ,000 -,038 ,445 110** ,010 .288** ,000	yield 059** ,000 .087* ,035 222** ,000 146** ,001 .299** ,000	m Yield .082** ,000 264** ,000 378** ,000 .163** ,002 -,115	yield 063** ,000 .146** ,000 122* ,049 135** ,001 .292** ,000	yield .180** ,000 ,045 ,321 -,016 ,805 338** ,000 .440** ,000	yield .111** ,000 .477** ,000 .331** ,000 .677** ,000 256**		
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% maize sold       Pearson         Sig. (2-ta         % sorgh. sold       Pearson         Sig. (2-ta         % sorgh. sold       Pearson         Sig. (2-ta         % millet sold       Pearson         Sig. (2-ta         % g/nuts sold       Pearson         Sig. (2-ta         % c/peas sold       Pearson         Sig. (2-ta         % c/peas sold       Pearson         Sig. (2-ta         Maize yield       Pearson         Sorghum Yield       Pearson         Sig. (2-ta         Pomport       Sig. (2-ta         Sorghum Yield       Pearson         Sig. (2-ta         Pomport       Sig. (2-ta	corr         .414*           iiled)         ,000           corr         .159*           iiled)         ,001           corr         .492*           iiled)         ,000           corr         .492*           iiled)         ,000           corr         .488*           iiled)         ,000           corr         .117*           iiled)         ,004	1           .717**           .000           .565**           .000           .804**           .000           .804**           .000           .461**           .000	.717" ,000 1 .911" ,000 0,000 1,000 ,104	.565** ,000 .911** ,000 1 1 -1.00** ,000 764**	804** ,000 0,000 1,000 -1.00** ,000 1 .364**	.461** ,000 ,104 ,239 764** ,000 .364** ,000	.166** ,000 -,038 ,445 110** ,010 .288** ,000	.087* ,035 222** ,000 146** ,001 .299** ,000	264** ,000 378** ,000 .163** ,002 -,115	.146** ,000 122* ,049 135** ,001 .292** ,000	,045 ,321 -,016 ,805 338** ,000 .440** ,000	.477** ,000 .331** ,000 .677** ,000 256**		
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Sig. (2-ta)       Tot. grain prod     Pearson       Sig. (2-ta)     Sig. (2-ta)       Maize yield     Pearson       Sorghum Yield     Pearson       Sig. (2-ta)     Sig. (2-ta)       Point     Sig. (2-ta)       Point     Sig. (2-ta)       Point     Sig. (2-ta)       Point     Pearson       Sorghum Yield     Pearson       P/millet yield     Pearson	iled) ,004	,000	· · ·			1								
Tot. grain prod     Pearson       Sig. (2-ta       Maize yield     Pearson       Sorghum Yield     Pearson       p/millet yield     Pearson			.239	000			.264**	.463**	,023	.440**	.306**	.216**		
Sig. (2-ta       Maize yield     Pearson       Sorghum Yield     Pearson       Sig. (2-ta       p/millet yield     Pearson	00rr 238*	100**	,	,000	,000		,000	,000	,604	,000	,000	,000		
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Sorghum Yield Pearson p/millet yield Pearson	iled) ,000	,000	,445	,010	,000	,000		,002	,000	,000	,000	,000		
Sorghum Yield Pearson Sig. (2-ta p/millet yield Pearson	corr059*	.087*	222**	146**	.299**	.463**	.039**	1	032* .887**		.054**	.070**		
Sig. (2-ta p/millet yield Pearson	iled) ,000	,035	,000	,001	,000	,000	,002		,041	0,000	,006	,000		
p/millet yield Pearson	corr .082*	264**	378**	.163**	-,115	,023	.278**	032*	1	,026	108**	-,021		
	iled) ,000	,000	,000	,002	,073	,604	,000	,041		,088	,000	,270		
0: (0.)	corr063*	.146**	122*	135**	.292**	.440**	.110**	.887**	,026	1	.112**	.086**		
Sig. (2-ta	iled) ,000	,000	,049	,001	,000	,000	,000	0,000	,088		,000	,000		
g/nuts yield Pearson	corr .180*	,045	-,016	338**	.440**	.306**	.212**	.054**	108**	.112**	1	.121**		
Sig. (2-ta	iled) ,000	,321	,805	,000	,000	,000	,000	,006	,000	,000		,000		
cowpeas yield Pearson	corr .111*	.477**	.331**	.677**	256**	.216**	068**	.070**	-,021	.086**	.121**	1		
Sig. (2-ta		0.00	000	.000	.000	000	000	000	270	.000	,000			
**. Correlation is significant at														
*. Correlation is significant at	iled) ,000		,000	,	,	,000	,000	,000	,210					

#### Tab. 2.7. % Income correlation matrix

#### 4.4 seeds sales

Seed multiplicators account for a minority of beneficiaries. The main intended effect is to provide beneficiaries with a sustainable source of seeds suppliers in the target zones. Focus groups discussions confirmed that marketing linkages for seed have been established: seeds producers sell a large share of their seeds through seeds' fairs, but largely outside the wards targeted by the project. Many cited buyers coming from Bulawayo or other remote zones. Most of the project's beneficiaries seeded material coming from the project, as a direct distribution, or as a pass-on from other beneficiaries. Although seeds fairs encountered a big success in terms of participation, they are not used by beneficiaries to source seeds. Nevertheless, as stated, the indicator shows an achievement of the project because it allowed seeds producers to enter a market.

### 4.5 pass-on of seeds

To fill this indicator the dataset has not been weighted by the geographic coefficient. Furthermore, this indicator has been assessed for the last year only. The shares of pass-on of seeds for the last season are well below the targets of 200%: sorghum has a share of 10%, pearl millet 5%, groundnuts of 13% and cowpeas of 6%.

#### 4.6 Balanced diet

To inform on this indicator, a food consumption score (FCS) is used. The score is a proxy of acceptability of the diet with a recall period of 7 days<sup>37</sup>.

Right after the inception of the project (2011), a survey was conducted among project beneficiaries and non-beneficiaries in the targeted wards. The FCS was calculated and the results showed that beneficiaries had, in general, a worst food consumption than non-beneficiaries (in Hwange 7.1% had a poor, 31.8% a borderline consumption, compared to, respectively 7.8% and 24.3% of the non-beneficiaries; in Binga the poor consumption was at 45.1% among beneficiaries, compared to 41% of non-beneficiaries, but the borderline was 23.1% against 0%). Nevertheless, in the households with contact farmers, food consumption was better: 0% and 28.4% of poor food consumption in Hwange and Binga, and 27.6% and 46.9% of borderline food consumption.

The 2014 survey showed a marked improvement in food consumption among beneficiaries (Tab. 2.8). It must be stressed that the FCS is highly dependent on the season; nevertheless, in 2011, data were collected after the harvest (i.e. the good season) while in 2014 they were collected in October, i.e. approaching the lean season. Therefore, it could be expected an improvement in the diet that goes beyond what these figures show. Acceptable food consumption among beneficiaries went from 61.1% to 73.6% in Hwange and from 31.8% to 56.5% in

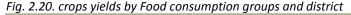
Tab.	2.8.	Food	consumption
group	os by di		

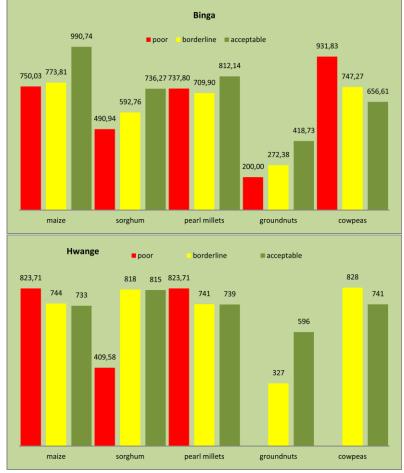
	BINGA	HWANGE					
poor	6,0%	1,5%					
borderline	37,5%	24,9%					
acceptable	56,5%	73,6%					

Binga. These figures are still unacceptably low, but the progress is significant. In comparison, the control has group а poorer consumption: in Binga poor consumption has a prevalence of 24.2%, borderline 27.2%. In Hwange, the poor and borderline food consumption groups account for, respectively, 16.6% and 61.6%.

In Binga, food consumption is associated with crop yields (Fig. 2.20): the average yields increase as households pass from poor, to borderline, to acceptable food consumption, with the exception of cowpeas, that seem associated with poor household food consumption, probably because in more marginal areas, most of the effort and investment is put in this crop. In Hwange, a clear trend is more difficult to detect.

An even marked distinction results from crossing the percentage sales of the crops by the consumption groups: in both districts, this percentage is higher among the





<sup>&</sup>lt;sup>37</sup> It has a theoretical range from 0 to 112, but thresholds are applied to distinguish between a poor (<21), borderline (21-35) and acceptable food consumption (>35). For more information on the method, see http://www.wfp.org/content/technical-guidance-sheet-food-consumption-analysis-calculation-and-use-food-consumption-score-food-s.

households with acceptable food consumption (Fig. 2.21). For most crops, the poor food consumption group did not sell any surplus. As the project directly affected marketing, it can be safely stated that it had a positive contribution to the improvement in the diet.

Nutrition is explicitly mentioned among the indicators of the overall objective, but nutritional status is usually evaluated with the prevalence of stunting, wasting, underweight and vitamins/micro-nutrients deficiencies. This would be expensive to assess and proxy data on these indicators from hospitals and health centres would be biased. From the analysis on the FCS, however, it seems very likely that the project led beneficiaries to diversify (i.e. increase the number of products consumed) and vary (i.e. have different sources for the same macronutrients, for example substituting maize with millet and/or sorghum) their diet.



### Fig. 2.21. % crops sales by Food consumption groups and district

### 4.7 Poverty

The poverty datum in 2011 was 81.7% prevalence in the Matabeleland Province. The evaluation survey cannot be rigorously compared with the poverty datum evaluation undertaken by ZimSTAT. Nevertheless, a proxy can be used. The food expenditures share is a telling indicator, because, even if it does not take into account the many dimensions of poverty, when food expenditures reach high levels, little resources can be spent for other basic needs. An arbitrary threshold<sup>38</sup> of 75% is used here to distinguish whether a household is food-poor: in fact, we can draw a food-poverty line, based on the food expenditures share of households.

Among the project's beneficiaries, the food-poverty prevalence is 46.6% in Binga and 18.5% in Hwange. Of course, these shares are high, particularly in Binga, but it seems that a progress has been achieved, when confronted with the ZimSTAT results, even if not exactly comparable to the poverty datum. Nor this seems directly attributable to the project, because food poverty in the control group is slightly lower: 45.4% in Binga and 15% in Hwange.

#### 4.8 Number of meals

The definition of meal is very dependent on culture and habits. The 2010 baseline survey collected the results, but the interpretation of what constitutes a meal was left to the individual understanding of enumerators and beneficiaries. These results show that the average number of meals per day "when there is enough cereal" was 2.97 in Binga and 2.78 in Hwange. Reading the

<sup>&</sup>lt;sup>38</sup> Although arbitrary, this threshold is largely used in poverty and food security analysis: the WB and WFP have made this figure a corporate threshold in analysis guidelines.

figures like this, one would think that little can be improved, as a number of three meals per day is generally considered satisfactory.

Nevertheless, the number of meals is seasonal and is different usually from member to member inside the same household. In order to assess any relevant change, the question has been refined in the final survey, distinguishing between the number of meals the day before the survey, during the period immediately after the harvest (good season) and before the harvest (lean season); further а distinction has been

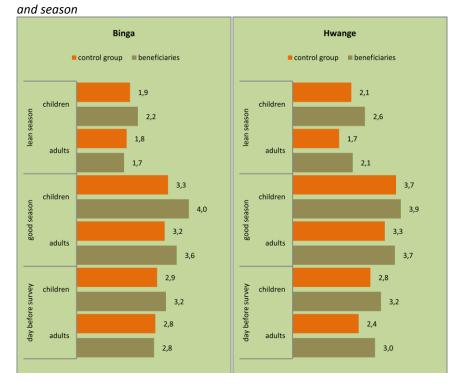


Fig. 2.22. Average number of meals, beneficiaries and control group, by district

recorded between the number of meals consumed by adults and children under 18. The data can be compared between the project's beneficiaries and the control group (Fig. 2.22), the difference between the averages in the good season and the lean season is significant, but it is more important in the control group, while it appears to be smoothed among the beneficiaries in both districts.

#### 4.9 Irrigation schemes

Although not explicitly among the indicators, the impact of the rehabilitation of the irrigation schemes has been assessed with the use of the net present value (NPV) as a mean of comparison the different irrigation schemes' economic performances and to assess their financial sustainability. The NPV is calculated per season (2 seasons per year, with the exception of Chentali that recently harvested three times) and are averaged. The methodology implies the calculation of all costs and benefits, discounted at the prevailing discount rate<sup>39</sup>.

Costs included in the analysis are irrigation fees, external labour costs, seeds, fertilizer, transport to the market and pump and other equipment depreciation. Labour provided by the HH also have a value, in terms of opportunity cost: nevertheless, because estimating the opportunity costs of different profiles in different locations is open to a great margin of error, in order not to bias the result, family labour has been estimated as free, but for low NPV per household, the issue of sustainability remains as these costs should be taken into account.

Because of the similarity of the results expected, the methodology and analysis have been applied to both the 6 irrigation schemes rehabilitated and the 4 institutional gardens set.

Among the cooperative irrigation schemes, the NPVs per enterprise show that all irrigation schemes are in active, but with a great variation: the leafy vegetables in Lukosi make more than 1,500

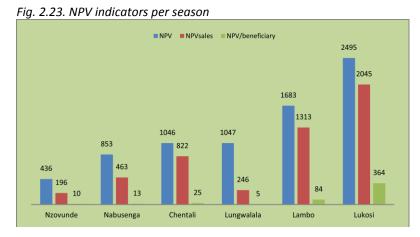
<sup>&</sup>lt;sup>39</sup> Set at 1.13% per month. The Reserve Bank of Zimbabwe does not have an official discount rate. The official interest rate is the Weighted Lending Rate, i.e. the sum of minimum nominal lending rates weighted by individual bank's loan book sizes and published by the Reserve Bank of Zimbabwe.

USD/season, while onions in Nabusenga less than 100 USD. The only product that is not financially viable was maize in Lungwalala, when self-consumption is not considered as benefit.

The produces that do not go to the market have a value to the producers when it is self-consumed<sup>40</sup>. Because productivity is similar to similar crops in different schemes, other factors explain the great difference in NPVs.

These main factors are sales (that in turn depend on the distance to the market) and the number of

beneficiaries, because even when the irrigated area is large, if plots are small, the coordination of joint activities (like collective marketing) becomes more difficult. Fig. 2.23 shows the NPV of the schemes per season, the NPV with the sales only and the NPV per beneficiary. Of course, it is only obvious that the more the production, the more this is sold. However, Nabusenga and Lungwalala (both in the Binga district) have levels of sales that do not match with the production



harvested. A case to study could be the comparison between Chentali and Lungwalala: they have the same production levels, but two crucial differences. The first is that Chentali has good markets available, and even a dedicated outlet built with the support (in materials) of the project: as a result, almost all the production is sold, with positive impacts on incomes. The second is the benefits per beneficiary: plot holders in Chentali benefit almost five times as much as those in Lungwalala per season. Furthermore, because of their entrepreneurship, plot-holders in Chentali actually benefit from three seasons per year of vegetable harvests, while those in other irrigation schemes prefer to plant maize during the rainy season<sup>41</sup>.

Marketing and individual sales (itself dependent on individuals' plot areas) are key determinants of the success of the irrigation schemes. Others, concerning their sustainability, will be treated in the following chapter. Regarding impacts, worth noting is also the case of Lukosi, which shows the highest NPV: it has a very good share of production sold and highest return per holder!

The success of institutional gardens of St. Patrick, Good Hope Mother, Lukunguni and Ntengwe has the same characteristics: although not for profits, the most successful gardens are those close to a market, generating enough cash to pay for repairs, as well as, of course, providing for the feeding programmes. A showcase is St. Patrick, with a production worth more than 4,000 USD per season, of which only 30% is consumed. The project allowed these institutions to implement their respective feeding activities in a more regular way, at less cost and with more varied menus: while sandza is still the main staple in the institutions visited, vegetables varied almost every day of the week. It is difficult to assess the impact on nutrition of the population that benefit from these institutions, but certainly the diet offered improved, compared to the situation before the project, when the only vegetable was often beans, a protein-rich, but micro-nutrient poor menu.

<sup>&</sup>lt;sup>40</sup> It is very hard to assess any improvement in terms of nutrition and micro-nutrients intake, but intuitively, self-consumption represents a save from cash expenditures.

<sup>&</sup>lt;sup>41</sup> This could be a very telling indicator of marketing linkages and it is interesting to note that, like any other innovation, early adopters are followed by many others: farmers in Navuzenga will do the same and, at the moment of this evaluation, were preparing the plots for drainage.

# **5 SUSTAINABILITY OF THE INTERVENTION**

## 5.1 Drought Tolerant Crops

The good level of ownership by project beneficiaries leads to the conclusion that the intervention is socially sustainable. Furthermore, as CA allows less soil disturbance, it is also environmentally sustainable.

The economic sustainability of the DTC component will depend of three key factors:

- Animals. Livestock provides manure and traction. Stress-sales of livestock in drought years can lead farmers in a vicious cycle because, in turn, fewer inputs would be available for farming. A positive unintended impact of the project<sup>42</sup>, however, is the increase of livestock possessed, especially in Hwange. In Binga, farmers are more vulnerable, not only for the usually dryer conditions, but also for possessing fewer animals.
- 2. Extension. Agritex currently has little support in operating funds and service training: this may pose challenges in terms of covered area and mobility. However, they are the public extension service and represent the long-term support structure for CA. The fact that Agritex was involved at all stages, its staff was trained and facilitated some simple paired plot demonstrations is an investment in capacity building.
- 3. Markets. The project made good efforts in establishing market linkages for beneficiaries, but the presence of a sure buyer is of course a key to sustainability<sup>43</sup>. JASPRO is likely to be such an actor and the market viability will largely depend on whether this association will operate efficiently and effectively.

These conditions holding, future prospects are good, although beneficiaries will continue to be vulnerable to agricultural-related shocks, like droughts or plant pathologies.

## 5.2 JASPRO

As described earlier, JASPRO was not an expected output of the original grant. The project began working at its creation after farmers had a sizable surplus and mobilised themselves: membership was open, but a fee of three USD had to be paid to be part.

From the farmers' point of view, the motivation to form such an association has three aspects:

- 1. The need for protection against economic forces too strong for individuals to withstand alone (in particular the risk-aversion of traders and processors, who have high transaction costs)
- 2. The impulse for self-development by making the best use of scarce resources
- 3. The concern to secure the best possible return from farming small grains within which individual households engage as producers, dealers and consumers.

There is the potential to add value to agricultural production, but small processors have to compete with larger manufacturers that can benefit from economies of scale and meet the needs of consumers for a wide range of products.

The formation of a processing/marketing association would allow achieving economies of scale and overcoming high transaction costs that farmers would face acting individually; it would also enable

<sup>&</sup>lt;sup>42</sup> Even if it is impossible to attribute the causes of this increase directly to the intervention.

<sup>&</sup>lt;sup>43</sup> Prices, nevertheless, will always be a factor to the economic viability of small grains.

farmers to access extension and inputs, improve product quality and quantity and negotiate more effectively<sup>44</sup>.

At the moment of the evaluation, JASPRO still had to begin its operations. The sustainability is assessed along two lines: financial and social.

As input and output prices were not yet negotiated, financial sustainability has been evaluated with the break-even output price: in other words, because it is safer, at the moment, to make hypothesis on the inputs' costs, the total (fixed and variable) cost was calculated, constituting a break-even price. Any price below it would make a loss, any price above, a benefit. This price is then compared to the price of similar products and the consumers' willingness to pay. Some important assumptions had to be made:

- Processing efficiency is 100%. This is different from the technical efficiency, i.e. the rate of end-product on the raw material. A 100% processing efficiency would mean that the operations are synchronised and there are no dead times between each step of processing. This is, especially at the beginning, unrealistic, but high efficiency is achievable with good management.
- There is little volatility of prices: this would mean that seasonality can be, to a certain extent, foreseen.
- The management is rational and no product is loss for negligence, infestation, or contamination.
- The first investment cost, i.e. what the project and the members brought to build the infrastructure and buy the machinery is not taken into consideration; rather, depreciation of building, tools and machinery is accounted.
- The processing capacity is stable at 400 Kg/hour, with no loss in capacity over the years.

Costs are calculated on a per-month basis: processing will not take more than 4-6 months per year, but all-year costs (electricity, guarding the premises, maintenance) are accounted per month.

Fixed costs are bills (electricity, water...), salaries and depreciation. They can be assessed –altogether - at 900 USD per month. Variable costs include the procurement of grains and packing material. Since the technical efficiency is 80% and the capacity 400 kg/hour, considering 6 hours of machinery per day and 24 working days in a month, the monthly capacity is 57.6 MT. Also, considering a procurement price of pearl millet of 0.3 USD/Kg, the total production cost is 0.91 USD/Kg. Even taking JASPRO's profits, transportation costs and distributors margins, consumer price should be very near one USD/Kg. A similar product is sold (although not much) with a price-tag of more than 3 USD/Kg. With adequate promotion, this product has the characteristics to be financially viable, because a demand exists, incomes in the area are rising and the price is competitive.

Social sustainability will depend much on how the association is managed. The team of people responsible for the various aspects of the operations has been met during the evaluation. They seemed very aware of the extra-demand in terms of time and resources that their role entails. However, the project could not accompany the association through the difficult moment of getting started with business and this poses a threat to its sustainability. Among the problems that JASPRO could encounter:

<u>Lack of realism of objectives:</u> commitment and purpose and two important ingredients in motivation. Achievement of these purposes is equally important. Objectives are expressions of purpose and expectations. To serve as motivators and guides to action, they have to be attainable and neither members nor others should expect too much from the association, including expecting to expand too quickly. JASPRO will operate in very marginal conditions and in commercial circumstances which any other form of business enterprise would find difficult. Its members are subsistence farmers. High operating costs, low margins, low turnovers, narrow stock inventories,

<sup>&</sup>lt;sup>44</sup> Farmers would however incur hidden costs from group activities, such as time spent in meetings, and the group might have to face governance problems.

seasonal trading patterns, crop failures are all familiar aspects of trading in such circumstances: indeed, were it not so, it could be expected that private enterprises would have moved in to exploit a profitable market. Expecting too much would be one fault, expecting too much too quickly another. JASPRO should be allowed to develop at a pace commensurate to the ability of members to manage, control and finance its development.

<u>Conflicts between economic and social purposes</u>: economic success is basic to the achievement of JASPRO's purpose. Cooperatives and associations are sometimes constrained in the extent they can mimic the objectives and business practices without abandoning their fundamental values. The creation of a collectively owned capital, like the facilities and machinery for gran processing, is very important and desirable, but it has the drawback that the element of members' share capital is such an insignificant proportion that professional management can afford to ignore, therefore ignoring a member's control in making business decisions.

<u>Misuse of the association to pursue political objectives</u>: attempts to divert the purpose and resources of farmers' associations to the support of particular political objective or movement are very common. However factional dissent among the group distract it from achieving its economic objectives; members can disenchant and lose interest, making easy for a minority group to take control and run the association to serve its own ends.

<u>Bad management</u>: a major cause of cooperative failure around the world is the constraint imposed on the exercise of management skills and authority by the democratic nature of the enterprise. That being so, it is sometimes suggested that the authority of the general meetings ought to be curtailed, leaving committees and managers to get on with the job of management. However, to do so would deny the purpose of the enterprise, to enable people to run the business. The solution might lie in increasing the level of member participation, not restricting it.

<u>Changes in the markets</u>: sustainability will demand flexibility. Farmers will need to respond quickly to market changes, in terms of quality, prices, quality and characteristics of the products. The evaluation collected main input prices and final products prices five years ago, through focus groups discussions. Even controlling for seasonality of grain prices, both input and output prices appear to have similar trend. This would make marketing operation easy. But consumers' preferences may change; other actors may enter the market, increasing the competition; crop failures may push grain prices higher. Other drivers may require changes in the way operations are conducted, or even packing. JASPRO managers will have to monitor the market constantly, for example with regular meetings with buyers and suppliers.

<u>Process steps</u>: having the control of marketing implies managing the various steps from seeding to delivery. Failures may occur in each step, compromising the quality, the quantity and, in the end, the sales of the product.

- a) Farming. The variety of crop planted, the farming system, including the use of inputs, and crop protection should be a concern of JASPRO. Crop failure can push input prices too high to run the business; insects' infestation may deteriorate the quality of the final product. Although JASPRO has no plan or capacity to do it now, monitoring crops and reducing farming risks is something advisable in the future. This can be achieved, when the association will have enough capital, by decentralising quality check operations and eventually providing seasonal credit (or, even better, inputs), to be discounted at the moment of purchase. A sound collaboration with Agritex is also essential.
- b) Post-harvest practices. Grains are left drying for an average of two weeks in the courtyards, than threshed manually or with sticks on rocky soils. These operations can be improved by using plastic sheets, in order to reduce losses and contaminants, like sand or stones, that deteriorate the quality and may damage the machines.
- c) Transport. Late delivery to the association may result in grain losses and insects' infestations, as the harvest is stocked in traditional huts. Transport is also costly, if every member has to negotiate it individually. Economies of scale could be exploited, for example

contracting a truck<sup>45</sup> that stops uploading at each member's village on the main axes. The association can be involved in different ways, from facilitating the contacts and coordinating collections to run its own trucks. The most appropriate arrangement, at this point, would be to help farmers negotiate transportation.

- d) Storing. This is a delicate step: JASPRO has 50 MT store. Although some members benefitted from a training visit at a local seeds company's store, managing such a big store, especially when fully stocked, is very different from managing the household store. An infestation (of rats, insects, birds, etc..) in an infrastructure like this may result in huge losses and the risk should be minimised. Staff should be trained on stock management (quality check before entering, first-in-first-out principle, insecticide treatments, bags piling ...) and should have a cleaning plan (regularly sweeping, clearing grasses 50 m around, checking rat traps, etc.).
- e) De-hulling and milling. The main risks of these operations are (i) mechanical failures /improper use of machinery and (ii) operations unsynchronised. A proper training and regular refreshments should be undertaken by the staff operating the machines on how to use them, maintain them and repair them. The operations should be synchronised as to avoid dead times and achieve the highest technical efficiency. If machines require spare parts, this also implies keeping a stock of them in order not to wait for their delivery to keep running the business.
- f) Packing. This operation is automated, so the same considerations apply as for other machinery. Furthermore, packing is also a component of marketing. Shall consumers' preferences change (packing size, need to specify nutritional contents, different languages...), JASPRO will need to react quickly. Ideally empty bags should be ordered not in bulk, but is regular small deliveries, to minimise stock and allow changing the specifications.
- g) Delivery. Regular interaction with customers should permit minimising the output stock. If the association develops and grows in market size, in the future a ramp to facilitate uploading of deliveries should be built<sup>46</sup>.
- h) Accounting. Transparent book-keeping is essential to the democratic nature of the association. Records should be kept and published regularly. Training in accounting is recommended to avoid doubts, but also to avoid the risks of low cash-flow, for example for failing to take capital depreciation into account (machinery and other assets need to be replaced, eventually, and a share of their value needs to be set aside every year).

## 5.3 Irrigation schemes and institutional gardens

The financial sustainability is a key determinant in irrigation projects, because when investments are made in infrastructure, beneficiaries should generate enough money to maintain it.

Overall, all the schemes and vegetable gardens are profitable: NPVs are all positive. Nevertheless, one should also consider family labour among input costs<sup>47</sup>. When plots are small, do low sales cover for the family labour opportunity cost? In Navusenda, Lungwalala and Nzovunde, it seems no, although this clearly depends on the areas: seasonal margins, excluding self-consumption are, on average, inferior to 7 USD. While this may change in the near future, as a result of marketing activities, it seems too little a reward if farmers have large plots.

Because the schemes are collectively owned, group cohesion and dynamism are also important for their social sustainability. From the groups met, the achievements of the training is evident: management committees collect fees, think at diversifying marketing channels and run the day-to-

<sup>&</sup>lt;sup>45</sup> Or, for smaller quantities, charts.

<sup>&</sup>lt;sup>46</sup> At the moment a ramp is only on the storage side, for downloading. If this is used, uploading would be more difficult for the presence of grains bags.

<sup>&</sup>lt;sup>47</sup> Except institutional gardens that employ waged labour.

day business with little or no disagreements. Two drivers can, nevertheless, play against the sustainability of these structures:

- 1. When plot-holders are numerous, it is difficult to have everybody's agreements and decisions may take long to be made, or too difficult to be made at all.
- 2. Institutional gardens are often managed by a group of two or three people that are not the main decision makers of the beneficiary institutions. This can represent a constraint when strategic choice have to be made (ex. deciding on the cropping pattern) and to request resources for maintenance, upgrades or even inputs.

### 5.4 cross-cutting issues

The project was not designed on the basis of a gender-differentiated analysis. However, the project could have led to a certain empowerment and awareness of the economic role of women beneficiaries, as a result of taking some control over these resources, in particular on the DTC component. It must be observed that the majority of contact farmers are women. Overall in the two districts, female participation in the project activities is on average around 62%, with 66%% in Binga and 58% in Hwange.

Through the awareness sessions on HIV/AIDS, Gender and Nutrition, the project improved female participation in the target areas.

Specifically from the adoption of CF practices, high water losses are addressed through factors that increase infiltration and reduce water evaporation (minimum soil disturbance and maintenance of soil cover). Soil fertility decline is addressed by increasing soil carbon through the use of mulching, manure application and increased efficiency of fertilizer use through precise application.

# **6 CONCLUSIONS AND RECOMMENDATIONS**

Considering the food insecurity, the poverty and the vulnerability to droughts in the target areas at the beginning of the project, the Livelihood diversification programme in Hwange and Binga is relevant to the priorities of the target groups and the technical package introduced is demand-based and needed, in particular the main component of the project, focusing on the introduction of drought-tolerant crops with CA to this regard. The intervention is also technically sound; the diversification effort is also relevant and based on two familiar pulses, groundnuts and cowpeas. In other words, it made sense, for a development intervention to select these areas with this technical package. However, the components of the project dedicated to the rehabilitation of irrigation schemes and the set-up of institutional gardens as well as the activities related to the PLWHIV and HIV/AIDS awareness seem separated from the crop intensification efforts and the intervention logic does not seem consistent.

The activities have been implemented in a technically-sound manner: the selection of beneficiaries was undertaken accordingly to the criteria specified, although those in Hwange seem better off than those selected in Binga. A great effort was put in capacity building: the concepts of CA, planting basins/ ripping (use of ripper tine), manuring, top dressing, micro- dosing, weed control, intercropping, rotation, mulching and Climatic & DTC efficiencies have been grasped, even if not all applied them altogether to their plots: in Binga, where beneficiaries adopted the technology proposed more slowly, lack of manure and mulching was sometimes put forward as a major constraint. As a result, behavioural change (i.e. the adoption of CA) proceeded at a different pace. Some waited to see early adopters' performance in their area or during exchange visits; some only dedicated a small plot to try CA, before adopting it as a practice. The different pace of technology adoption seems to be a recurrent difference between Hwange and Binga. Possible explanations of this phenomenon are the fact that Agritex officer in Binga have a larger area to cover, and therefore are less able to follow-up all project's beneficiaries, but also risk-aversion, given that the conditions of farming and productivity in Binga were less performing when the project started. During the training sessions, awareness sessions were also conducted, under the supervision of Lubhancho House. These capacity building activities were coupled with the main technological package introduced that consisted in using CA technology, in combination of seeds of sorghum, pearl millet, groundnuts and cowpeas and fertilisation. Although unforeseen events delayed the results (the first procurement of seeds was not delivered according to the specification and seeds' repayment rate was lower than expected) the production of small grains went well beyond the target. Overall, activities for the DTC component have been the main focus of the project, but results for other components have been achieved as well.

Activities have been implemented cost-effectively: savings from funding certain activities even allowed for expanding the scope of the project to other activities, like the creation of JASPRO, an association dedicated to the marketing and processing of small-grains. This is commendable, but even more is that the project did not just delivered the outcomes, but mobilised beneficiaries and convinced many of them to invest in these outcomes, like for the agri/dealer and the outlets of some irrigation schemes.

In terms of impact, the project has been a success. The main component of the intervention successfully introduced new small grain varieties and CA practices that had, as main effect, the increase in yields, the increase in income and the diversification of the diet, as subsistence farmers could increase their livestock, but the diversification with pulses had little uptake. During a particularly dry second year of the project, groundnuts and cowpeas seeds had a poor germination<sup>48</sup>. In general, all aspects of capacity building have been treated very extensively and several best practices can be drawn from the project's implementation: training sessions have been planned along the cropping year and these have been complemented by several practical lessons, like the demonstration plots and sharing occasions (brown fairs, exchange visits). In the opinion of the evaluator, this mix should be learned and implemented in other interventions, in addition to two further points:

- 1. The use of contact farmers. It is difficult to generalise on whether contact farmers as entry point for a change in practices is always appropriate: even this project experienced late or partial adoption of CA. However, the "election" of contact farmers, rather than their selection, in this context, seemed to work very well<sup>49</sup> and is certainly a recommendable practice, although targeting took long.
- 2. The implication of Agritex. Despite lacking resources, this is the perennial institution that is supposed to continue the extension: training staff and leading them to change the way they carry out this service is crucial to the sustainability, but also for achieving the results, as recognised by beneficiaries themselves.

Even if not all the recommended CA practices have been correctly put in practice in the prescribed way, the increase in yields led to an increase in income.

This is especially evident in another component of the project, supporting the rehabilitation of irrigation schemes: even here, the effects have been mixed, but where plots are large enough and markets exist, beneficiaries took the opportunity offered by the project and sensibly increased incomes.

As the beneficiaries of the project's components are distinct by design, effects do not sum up in the same target population.

The 20% target of yields increase has been largely achieved for all crops but for groundnuts in Hwange. In Binga, because of the low yields before the project's inception, farmers have shown the biggest progress, but the rate of adoption of CA techniques has been reportedly slower, for beneficiaries' risk aversion and less extension intensity.

Many factors have contributed to this increase in productivity, but the correlation between the possession of livestock and yields is stronger, placing the combination of CA techniques and animal husbandry as a particularly successful practice and a lesson for future interventions. This is one important finding of the evaluation and a major lesson to be learnt: livestock play an important role in livelihoods and future intervention should include a livestock component while introducing CA to ensure the fully uptake of CA techniques and expand cropped areas (see below), but also to reduce vulnerability to livestock shocks and ensure a sustainable use of livestock and agronomic resources.

The area cropped, nevertheless, did not increase, as a result of inputs constraints (labour, manure, mulching...). A key determinant for its increase is the possession of draft animals, again. Future interventions in smallholders agriculture will need to combine CA with sustainable livestock production practices (hay, veld management, etc..), because this represents a condition to scale-up the technology to larger areas. The need to introduce sustainable animal feeding would be relevant

<sup>&</sup>lt;sup>48</sup> The seeds that germinated were affected at flowering stage hence farmers did not harvest to satisfy their food needs first and then to repay into the seed loan bank.

<sup>&</sup>lt;sup>49</sup> Although not quantitatively assessed, the capacity built among few seed producers is also a key of success and a guarantee of sustainability.

especially when less maize is cropped, because sorghum and millet do not yield much crop residue, which plays a very important role to communal farmers in terms of animal feed.

Income also grew, but marketing channels developed little, farmers preferring informal sales. Yet, marketing is crucial for the sustainability of the action. The project actively has sought to develop marketing linkages as production surpluses became important. Its main outcome is the support of a dealer/processor association, JASPRO, based in Jambezi. This was a development that was not foreseen in the original grant, and the processing operations were beginning only when the project was phasing out. It is therefore difficult to assess the impact of this marketing channel on beneficiaries, but, given the importance of small grains in the food system, there should be market opportunities and the potential to add value to agricultural production. The formation of a processing/marketing association would allow achieving economies of scale and overcoming high transaction costs that farmers would face acting individually; it would also enable farmers to access extension and inputs, improve product quality and quantity and negotiate more effectively. From the analysis of the intervention's financial sustainability, the association should be able to product millet flour at a cost that is attractive to consumers in the area; however, the project could do little to support the association's management through the difficult moment of getting the business started: many problems (treated in Section 6) that threaten the sustainability of the association could still arise.

This evaluation makes the following recommendations:

To the NGOs that implemented the project:

<u>**R1.</u>** Similar interventions should make use of the lessons learned during this experience, in particular the use of contact farmers, the implication of Agritex and the planning of training together with exchange visits and demonstration plots.</u>

**<u>R2.</u>** Interventions aiming at introducing and extending CA should do it in combination with support to the livestock, as this offers opportunities to farm larger plot under CA. By doing so, a support to beneficiaries' capacity in animal husbandry, feeding, hay making and breeding should be designed.

**<u>R3.</u>** Marketing support is recommended because it facilitates the uptake of new crops and technologies and guaranties the sustainability of this and similar interventions. This support can take the form of contract farming, but also, and probably more importantly, of training, introduction of grading and standards and the share of marketing information.

<u>**R4.</u>** More extensively use visual material during trainings, including posters and leaflets to be left among the communities.</u>

**<u>R5.</u>** The project should prepare a second phase, targeting the development of JASPRO, as a catalyst of local development. This second phase should, as a priority, aim at assuring that the necessary skills and capacity is mobilised where needed (storing, accounting, management, etc.), building and stabilising marketing linkages and preparing the associations to deal with all problems (described in Chapter 6) the may arise, whether technical or managerial. In order to facilitate the passage, a detailed hand-over document should be prepared by the project.

R6. The beneficiaries of the two districts seem to have a different adoption rate and pace, farmers from Binga being more risk-averse. Given the positive feedback received by the exchange visits organised by the project, these should be used in particular to facilitate adoption among farmers with similar characteristics in terms of plot size, livestock, labour availability, access to markets and soil/climate.

To the Government institutions:

**R7.** Government agencies and development actors should consider the potential of the JASPRO association as channel of communication and dialogue, and incorporate it into decision-making at local level.

**<u>R8.</u>** As a basis for initiating dialogue with and providing support to the JASPRO association, Agritex needs to survey and develop an understanding of the association practices as they develop.

## To JASPRO:

**R9.** The JASPRO association should regularly identify its own areas of weakness, which need to be addressed. The association should engage in other activities that should be considered, benefitting its members, like the organisation of joint transportation (at cost) for smallholder farmers, in order to reduce individual costs and exploit economies of scale; the maintenance of a register of defaulters; linking members to the formal banking sector.

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# **ANNEXES**

## ANNEX 1: Terms of References Objectives of the action

<u>**Overall Objective**</u>: To improve the living standards of communities and vulnerable groups through addressing food and nutrition insecurity challenges faced by households in Hwange and Binga Districts of Matabeleland North, Zimbabwe.

<u>Specific Objectives</u>: To enhance Zimbabweans' capacity to be food independent and improve nutritional standards through sustainable livelihood diversification including production of drought tolerant crops, vegetables, community based seed system, links with private markets, livestock management skills.

## Target groups

- 10,000 hh (seeds distribution) hh selected under needs and ability based criteria;
- 625 contact farmers (direct training and seeds distribution) Among the above, the most capable of providing leadership
- 100 hh (quality seeds production)
- 300 hh (livestock management training) hh already engaged in livestock production
- 150 hh (chicken distribution) very vulnerable hh ie. Child or elderly headed hh
- 30 AGRITEX field officers (trainings)
- 4 institutions (garden rehab.) previously provided with drip kits
- 317 hh with plots included in the 6 irrigation schemes to be rehabilitated

### **Objective of the Evaluation**

As the intervention is approaching its end, COSV would like to carry out a final evaluation to analyse the actions implemented within the "Livelihood diversification program in Hwange and Binga Districts" in the districts of Hwange and Binga in the 54 months of the project. In particular, the evaluation will be carried out with respect to the following criteria:

<u>**Relevance**</u>: the evaluator will analyse the design of the intervention, and will observe whether and to what extent the foreseen results and objectives were adequate in relation to the context at the moment of the identification; the evaluator will consider the relevance of the means proposed to address the core needs and problems identified previous to the intervention.

In particular, the evaluator will focus on the following issues:

1. Whether the General Objective and the Specific Objective responded to real needs existing in the area at the moment of the identification of the intervention. The analysis will consider whether the objectives were congruous with respect to the context, and will observe possible changes undergone.

In particular the evaluator will assess whether the strategy of the intervention, focused on food security and diversification of livelihood was the most adequate to tackle and improve the living condition of the communities of the targeted areas

The study will assess the adequacy of the proposed objectives to the context and environment to assess whether these had the means to respond in an appropriate way to the project activities and to actually deliver the planned services. The evaluator will analyse the adequacy of the OVIs, and will consider whether they allow a relevant and detailed assessment of the progress of the project.

- 2. The consultant will assess whether the Results chosen to achieve the Specific Objective are relevant, taking into account the current context and environmental conditions during the Project implementation. The adequacy of the OVIs will be also analysed.
- 3. The consultant will examine the adequacy of the component of direct provision of inputs (seeds, seedlings, constructions, rehaibilitation, garden tools, etc.) as a mean to address the identified needs in the area, the selection criteria of the beneficiaries and of the distribution of the aforementioned inputs.

**<u>Efficiency</u>**: The evaluation will assess the level of achievement of the results in relation to the use of the Human and Financial resources available in the 54 months of the project.

In particular, the evaluator will assess:

- 1. The use of financial resources compared to the original time frame.
- 2. Whether the expected outcomes were achieved in a timely way according to the resources available and the scheduled work plan.
- 3. Whether the foreseen budget for trainings, per diems and direct purchase of inputs was adequate for the identified needs.
- 4. Whether the choice of human resources has been qualitative and quantitative adequate
- 5. Whether the right technical financial choices have been taken to ensure the efficiency of the program and which external elements have influenced these choices

<u>Effectiveness</u>: the evaluation will assess the level of achievement of the Results in the 54 months of the project:

1. Result 1.1: Improved community capacity for sustainable agriculture productions (crop and poultry), marketing and strengthened capacity for extension workers to farming practices and access to market

The evaluation will examine whether the targeted beneficiaries have put in practice the skills and knowledge provided during the training courses, observing the impact of their action on the agricultural production, on number of chicken distributed and multiplied, on adoption of CF techniques, on knowledge about HIV/AIDS prevention. Moreover the evaluation will assess the quality and adequacy of the marketing constructions built within the project activities. The difference between the beneficiaries conditions before the project, and after the provision of the training will be observed and highlighted, particularly through the feedback of plot farmers, Agritex operators, irrigation schemes farmers.

- 2. Result 1.2: Increased availability and access to Drought Tolerant Crop (DTC) seed for vulnerable households through the introduction of a sustainable seed systems. The study will assess the access of the 10.000 beneficiaries to the local produced seeds (cereals and legumes) and the amount of the cereals and legumes produced. The difference between the beneficiaries conditions before the project, and after the provision of the training will be observed and highlighted, particularly through the feedback of plot farmers and Agritex operators.
- **3.** Result 1.3: Enhanced selected farmers capacity to produce quality Drought Tolerant Crop seed.

The evaluator will assess the production and sales of Foundation Seed, through the feedback of the 100 Foundation seed producers.

4. Result 1.4: Improved institutional gardens (e.g. hospitals, orphanages, community irrigation committees) capacity to produce vegetables and to market them. The study will investigate the adequacy of the rehabilitation of the irrigation schemes and institutional gardens and the fruit and vegetable production and sales of the irrigation scheme and institutional gardens, through the feedback of the institutional gardens and

In detail, the evaluation will focus on the analysis of:

irrigations schemes representatives.

- 1) Which was the contribution of the partners in achieving the results
- 2) Which was the contribution of COSV in achieving the results
- 3) How the management was effective in running the program: management of local staff, relationship with local authorities, institutions, EU delegation in terms of quality and quantity
- 4) Whether unexpected results have been identified and how they have influenced the implementation of the program
- 5) How risks have been assessed and containment measures have been applied
- 6) Whether the results have actually contributed to the creation of benefits to the beneficiaries.

<u>Sustainability</u>: The analysis of the sustainability will focus on assessing whether the intervention managed to set up adequate conditions to ensure the continuation of the positive effects generated by the project.

The analysis will also concentrate on establishing whether it will be possible, once the project has ended, for the beneficiaries to carry on with the activities of agricultural production (DTC, Foundation seed, fruit and vegetable of the irrigation scheme and institutional gardens), sales of surplus, management of the Association and of the new infrastructures.

Suggestions will be made on possible improvements and/or means to guarantee that the acquired knowledge will be kept as common heritage, both for the direct beneficiaries of the intervention, and for the rest of the communities in the area.

**Impact:** the analysis of the impact will assess the effects of the program on the direct and indirect beneficiaries, through

The consultant will also evaluate the potential durability and the multiplier effects of the benefits and if there are gaps or critical areas. The consultant will assess the potential opportunities to strengthen the impact.

### Methodology and foreseen activities

- Study of the documentation; the documents related to the project will be given to the evaluator for a preliminary review. (List of documents available is provided below).
- The evaluator with the support of COSV will prepare a Work Plan that will detail the tools to collect data, key people to be interviewed, and methodologies to be used. Meetings will be included with the COSV Country Representative, COSV Project Coordinator, Lubhancho House Coordinator, Lead Trust Coordinator and and project staff; meetings with the relevant stakeholders (EU Task manager, Agritex, District Administrator). Meetings, interviews, focus groups will be organized and carried out in the field with the beneficiaries of the

components of the intervention.

The evaluator will suggest, when relevant, meetings with other possible stakeholders.

• Field phase: the consultant will produce the requested information in order to satisfy the ToR requirements, using the tools previously indicated in the Work Plan and other tools necessary for the evaluation, when needed. COSV explicitly requests the evaluator to use the necessary tools to encourage the involvement of all the program partners and of the beneficiaries during the evaluation process.

The evaluator is urged to use both quantitative and qualitative methodologies

- The final report will include a section called "Conclusions" and "Lesson learnt", with the positive and the negative aspects related to each criteria, the good practices and lessons learnt; it will also incorporate a section of "Recommendations", where suggestions will be listed, according to the requirements gathered in the ToR, regarding also the future of the strategy of COSV.
- The final report will respond to all the questions raised in the ToR and will be discussed in a first draft version with COSV; it will have to be handed in within two months after the end of the mission.
- The consultant will reserve confidential information or will save the anonymous right of the informants which have participated into the process of consultancy and who don't desire to be identified. All the transcription will be realized considering the verbal authorization of the informants. All the achieves/files of documents that may be necessary for the implementation of the consultancy will only be for the exclusive use of the same and must be dropped to COSV.

Document	Availability
Project as per last contract (narrative + Log	COSV Milan – COSV Zimbabwe
Frame)	
Project Budget as per last contract	COSV Milan – COSV Zimbabwe
Interim reports (both narrative and financial)	COSV Milan – COSV Zimbabwe
ROM Mission Reports	COSV Milan – COSV Zimbabwe
Marketing Analysis	COSV Milan – COSV Zimbabwe
Ministry of Agriculture Monitoring Mission	COSV Milan – COSV Zimbabwe
Mid-term Review	COSV Milan – COSV Zimbabwe
Baseline Survey	COSV Milan – COSV Zimbabwe

### Documents and sources of information:

#### *List of key persons to interview:*

Country Representative	COSV
Project Coordinator	COSV
Project staff	COSV, Lead Trust, Lubhancho House
Partners Representatives	Lead Trust, Lubhancho House
Local Authorities	District Administrator, Agritex District Officer
Beneficiaries of the action	DTC producers, Foundation Seed producers,
	Irrigation Scheme Representatives,
	Institutional Gardens Representatives

#### ANNEX 2. Household Survey Questionnaire

#### To be filled by the enumerator:

001	DATE :   _  /   _  / 2014 day	002 ENUMERATOR
003	_ District	
004	_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _	
005	_ _ _ _ _ _ _ _ _ _ _ _	_    006   _  Household number

#### INFORMED CONSENT MESSAGE : TO BE READ :

My name is\_\_\_\_\_. We are here to collect information about the living conditions and well-being of people and families in this district. Your household was selected to be part of this survey. I would like to speak to you and/or your spouse/partner. The questionnaire will take a maximum of 30 minutes.

Your household's participation is important but voluntary and you can choose not to answer any or all of the questions.

Your participation does not guarantee future assistance in any way. However, please note that your participation is of great value to this study which tries to better understand the needs of the people to improve their situation in the future.

The team will keep all responses you provide confidential.

Do you have any questions for me? You may ask questions about this study at any time."

HOUSEHOLD : A group of two or more persons making a common provision for food or other essentials for living

SECTION	1: DEMOGRA	PHY																				
101 -	How many people live in this household?												PEO	PLE								
102 -	What is the gender of the household's head?											1 MA	LE			2	Fén	<b>/</b> ALE				
103 -	What is the a	the age of the household's head (in years)?																AGE				
104	How distant is the house from the paved road, by foot?									1     Less than 30 minutes       2     Between 30 minutes and one hour       3     More than one hour												
105	How distant is the house from the nearest market, by foot?									1       Less than 30 minutes         2       Between 30 minutes and one hour         3       More than one hour												
106-	Fill the table	belov	w by reco	ordin	g the nu	mber	of house	ehold	's mem	bers by	y age and	d gend	ler o	category								
			0-5 YRS	5		6 -1	2 yrs		13 –	18 YRS	3	1	19 –	59 yrs			60 OR MORE					
	MALE								L													
	Female								_													
106-	Has your household been a beneficiary of the project?																					
107	If yes, what activity did the household benefit from? (mark all that apply) <ul> <li>If yes, what activity did the household benefit from? (mark all that apply)</li> <li>If yes, what activity did the household benefit from? (mark all that apply)</li> <li>If yes, what activity did the household benefit from? (mark all that apply)</li> </ul> <ul> <li>If yes, what activity did the household benefit from? (mark all that apply)</li> <li>If yes, what activity did the household benefit from? (mark all that apply)</li> <li>If yes, what activity did the household benefit from? (mark all that apply)</li> <li>If yes, what activity did the household benefit from? (mark all that apply)</li> <li>If yes, what activity did the household benefit from? (mark all that apply)</li> <li>If yes, what activity did the household benefit from? (mark all that apply)</li> <li>If yes, what activity did the household benefit from? (mark all that apply)</li> <li>If yes, what activity did the household benefit from? (mark all that apply)</li> <li>If yes, what activity did the household benefit from? (mark all that apply)</li> <li>If yes, what activity did the household benefit from? (mark all that apply)</li> <li>If yes, what activity did the household benefit from?</li> <li>If yes, what activity did the household benefit from?</li> <li>If yes, what activity did the household benefit from?</li> <li>If yes, what activity did the household benefit from?</li> <li>If yes, what activity did the household benefit from?</li> <li>If yes, what activity did the household benefit from?</li> <li>If yes, what activity did the household benefit from?</li> <li>If yes, what actis a transform of the household benefit from?&lt;</li></ul>																					
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	Ox-drawn plo	0	No	1	yes	0	No	1	yes	bicyc	cle		0	No	1	yes	0	Ν	lo	1	yes	
	Cultivator	0	No	1	yes	0	No	1	yes		ile phone	•	0	No	1	yes	0	Ν	lo	1	yes	
	Harrow	0	No	1	yes	0	No	1	yes		chcart		0	No	1	yes	0	_	lo	1	yes	
	Radio	0	No	1	yes	0	No	1	yes		el barrow	v	0	No	1	yes	0	Ν	lo	1	yes	
202	How many h	eads	do you l	have.	of the f	follow	ing anim	als?	WITH Y	YEARS	5											

a. poultry	Now          2011            2013          2010            2012
b. porcs	Now          2011            2013          2010            2012
c. cattle	Now          2011            2013          2010            2012
d. Cattle (draft)	Now          2011            2013          2010            2012
e. Donkeys (total)	Now          2011            2013          2010            2012
f. Sheeps	Now          2011            2013          2010            2012
g. Goats	Now          2011            2013          2010            2012

301	What is total arable are	a that is	s available fo	or use by	y your household?	Hectares				
	area was planted to rop) during the last I season?				ource of seed for (mention ehold last season?	304. How much <i>(me</i> ) last season?	ntion crop) did your household harves			
Crop	Area planted (ha)		S	ource of	seed* for last season		Amount harvested (kg)			
Maize										
Sorghum	1									
Pearl mill	let									
Groundni	uts									
Cowpeas	3									
	1. own retained seed			4. seeds		<ol><li>given by NGO</li></ol>				
	2. cash purchase from 1 3. loan (specify source)				ht from neighbour by relative/neighbour	8. Government 9: other				
305				6. given	by relative/neighbour	9: other	re 4 =Mix of fertilizer and manure 5 =			
305	3. loan (specify source) What method of soil fer do you mostly use?		provement	6. given	h by relative/neighbour   Nothing 1=fertiliser 2 =animal m	9: other nanure 3 =organic manu	re 4 =Mix of fertilizer and manure 5 = Major buyers* of the harvest			
305	<ul><li>3. loan (specify source)</li><li>What method of soil fer do you mostly use?</li><li>a. How much of your</li></ul>	tility imp	provement Crop Maize	6. given	h by relative/neighbour   Nothing 1=fertiliser 2 =animal m er (specify)	9: other nanure 3 =organic manu				
305	3. loan (specify source) What method of soil fer do you mostly use?	tility imp	provement Crop Maize Sorghum	6. given 0 = 0 th	h by relative/neighbour   Nothing 1=fertiliser 2 =animal m er (specify)	9: other nanure 3 =organic manu				
	<ul> <li>3. loan (specify source)</li> <li>What method of soil fer do you mostly use?</li> <li>a. How much of your (mention crop) did you</li> </ul>	tility imp	provement Crop Maize Sorghum Pearl mille	6. given 0 = 0 th	h by relative/neighbour   Nothing 1=fertiliser 2 =animal m er (specify)	9: other nanure 3 =organic manu				
	<ul> <li>3. loan (specify source)</li> <li>What method of soil fer do you mostly use?</li> <li>a. How much of your (mention crop) did you from last season's</li> </ul>	tility imp	provement Crop Maize Sorghum Pearl mille Groundnu	6. given 0 = 0 th	h by relative/neighbour   Nothing 1=fertiliser 2 =animal m er (specify)	9: other nanure 3 =organic manu				
	<ul> <li>3. loan (specify source)</li> <li>What method of soil fer do you mostly use?</li> <li>a. How much of your (mention crop) did you from last season's</li> </ul>	tility imp	Crop Maize Sorghum Pearl mille Groundnu Cowpeas	6. given 0 = 0 th 0 =	h by relative/neighbour   Nothing 1=fertiliser 2 =animal m er (specify) Amount sold from last season'	9: other nanure 3 =organic manu				
305 306	<ul> <li>3. loan (specify source)</li> <li>What method of soil fer do you mostly use?</li> <li>a. How much of your (mention crop) did you from last season's harvest?</li> </ul>	tility imp	provement Crop Maize Sorghum Pearl mille Groundnu	6. given 0 = 0 + 0 + 0 + 0 + 0 + 0 + 0 + 0 +	h by relative/neighbour   Nothing 1=fertiliser 2 =animal m er (specify) Amount sold from last season'	9: other nanure 3 =organic manu				

SECTIO	SECTION 4 : LIVELIHOODS AND INCOME																	
401. What are the resource		resources	at proportion of s in cash or kind activity contribute															
		velihoods?	to the hou livelihood	usehold's	Jan	Feb	Mar	Apr	May	June	jJuly	Aug	Sept.	Oct.	Nov.	Dec.		
Main act	ivity	 (CODE	L	_    %														
Seconda activity	iry	 (CODE	L	_   %														
Tertiary activity	tiary  _ _          %																	
electricia 6. private	ock g Irer alised sk an, etc.) e busine			ur (contra ion/bours nily colla s		(gardene	r, driver,	houseke	eping, el	tc.)								
		OD CONSU					- <b>f</b> the a la		10	1	Luce e la							
501 502		•	•	did the adults (16 o did the children (0-		,					_  meals							
JUZ		-	•	does the household	-													
503		s ( <b>16 yrs or</b> en ( <b>0-15 yrs</b>		_  meals														
504	In ger		nany times	d eat during the gap period?														
J04		en ( <b>0-15 yrs</b>																
505	-		-	ompared to 4 years	-	11 -	yes	no										
How many days, among the last 7, the househol           506         Number of days of the last 7						old consumed the following products, and what was the main source?       on     Main source       (code source)												
0 1 Maiz	ze			days			1 Self-production											
0 2 Sorg						·		2 Market										
0	Other cereals (bread_rice)							3 Hunting, fishing										
0 4 Puls	es (bear	ns, groundn	uts)	days		 		4 Collect										
0 5 Vege	etables			days				5 Exchange										
0 6 Fruit  _  days						6 Family gift												
0 7 Fish					7 Food distribution by Govt/WFP/NGO													
0 8 Mea	t						8 C	Other										
0 9 Eggs	S			days		 												
1	y (milk, d	cheese, yog	urth)	days														
1 1 Oil				days														
1 2 Suga	ar			days														
1	diments			days														

507	During last year a	and 4 years ago, indi	cate the mon	ths whe	n you wer	e able to	access	the follo	owing so	ources of	f food:				
JU 1	Your own agri	cultural production	Jan	Feb	Mar	Apr	mai	June	jJuly	Aug	Sept.	Oct.	Nov.	Dec.	
		LAST YEAR													
		4 YEARS AGO													
	Your own liv	vestock production	Jan	Feb	Mar	Apr	mai	June	jJuly	Aug	Sept	Oct.	Nov.	Dec.	
		LAST YEAR													
		4 YEARS AGO													
		Market	Jan	Feb	Mar	Apr	mai	June	jJuly	Aug	Sept	Oct	Nov.	Dec.	
		LAST YEAR													
		4 YEARS AGO													
SECTI	ON 6 : EXPENDITU														
		) days, how much die	d your house	hold spe	ent for the	followina	items. ii	n cash.	credit a	ind how	much did it	consumed o	of the self		
601	production?		, ,												
	Fill all cases	Cash (USD)			Crea	dit/borrow	(USD)			Estimati (USD)	on of the va	alue of self-p	roduction co	onsumed	
01	Maize	.	_ .				_   .	_		× /		.      .			
02	Sorghum														
03	Other cereals (bread, rice)		_ .												
04	Pulses (beans, groundnuts)														
05	Vegetables		_ <u> ·     </u>												
06	Fruit		_ <u> ·   </u>												
07	Fish														
08	Meat		_ <u> ·]    </u>												
00			_ <u> ·    </u>												
09	Eggs Dairy (milk,	<u> </u>	_ .									· <u> </u>			
10	cheese, yogurth)			1											
11	Oil			1											
12	Sugar			1											
13	Soap/detergent		_1:11111												
14	s Restaurant/foo d out of the	<u> </u>	_ .									· <u>              </u>  .	<u>      </u>		
15	house Alcohol and	<u> _</u>  .	_ .												
	tobacco House		<u> .     </u>												
16	Materials and equipments														
17	Medicins/regul ar health expenses				I	1.1 11	.								
18	Rent		_! <u>;                                    </u>		l	[`]]]	<u>-III</u>     .	_III							
19	Transport		! <u></u> !  .		l-		<u>-III·I</u>    .	-111							
20	Charcoal/gas/	<u>  •   </u>	_!:			!·!!!	_   ·	_111							
	wood	<u> _ ·   </u> _	_ .			U		_							
21	Water    . .     . .						. _								

22	milling	
23	Leisure	

602	During the last 6 months, how much did your household spend for the following categories?								
		Cash (USD)	Credit/borrow (USD)						
01	Health								
02	Clothes and shoes	·    ·							
03	Tools and equipment for the land or house	· _							
04	Agricultural inputs (seeds, fertiliser, fodder)		111.11.11.11.11						
06	Sanctions, taxes	.							
07	House Construction or repairs	,							
08	rent	.    .							
09	Education/school fees	. .     .							
10	Special events (weddings, funerals, celebrations)	!! !!							
11	Repaying debts								