During the 2019/20 season, LFSP piloted Pfumvudza plots to promote low input agricultural systems in response to the consecutive poor rainfall seasons and inflationary macro-economic environment. This drive saw 53,004 farmers from the three LFSP clusters in Manicaland, Midlands and Mashonaland Central undergo training on the Pfumvudza plot concept, with 9,281 going on to apply the concept under the maize crop at their family farms. The farmers applied the different components of the Pfumvudza package to varying degrees during the season. An assessment of the Pfumvudza performance during the 2019/20 season in the three LFSP clusters was assessed and its contribution towards household food security determined.

THE PFUMVUDZA PLOTS CONCEPT

Pfumvudza is a concept of conservation agriculture (CA) that is designed to meet food security for an average household of six members over one year. All the CA principles are applied "on time, at standard, without wastage and with joy" on a plot measuring 39m x 16m, which represents 1/16th of a hectare. The 0.0624 hectare plot has 52 planting rows each with 28 planting stations holding 2 maize plants per station. The 56 maize plants in each row will give 56 cobs which give one bucket (20 litres) of shelled grain. Each bucket can provide grain to feed a family of six for one week. The 52 buckets from the 52 rows will feed the family for 52 weeks, which is one year.

METHODOLOGY

A total of 687 Pfumvudza farmers were tracked and monitored over the season and are the basis of this analysis. Altogether about 9,281 LFSP farmers had a Pfumvudza plot each during the 2019/20 agricultural season. Thus the sample represents about 4 percent of LFSP farmers who practiced Pfumvudza. Yields from the Pfumvudza plots were compared with the average national maize yield of 1 ton per hectare.

KEY RECOMMENDATIONS FROM 2019/20 SEASON

1. Dedicated promotion of the Pfumvudza concept in its entirety, with full attention to detail for household food security
   * Emphasize to farmers in extension messaging that the desired results can only be achieved if the full basket of prescribed Pfumvudza technologies is embraced
   * Work with and support farmers to ensure that they attain the potential yield from each Pfumvudza plot to ensure household food security for a year, based on proven productivity levels
2. Mulching is a key and critical success factor and game changer and so should be prioritized.
   * Various mulching practices should be promoted for uptake by farmers.
   * Live mulching options should also focus on drought tolerant crop species such as cowpeas and fodder crops like lablab. Since sugar beans are not an appropriate cover crop, neither nor are bushy types of cowpeas as they do not adequately cover the soil
3. Rainwater management (harvesting and moisture conservation) is key to high productivity for household food security. Explore and apply more rainwater harvesting and soil moisture conservation practices to guarantee adequate moisture for the crops
4. For drier and marginal areas planting of traditional grains instead of maize on Pfumvudza plots is recommended
5. Production of Vitamin A Orange Maize under Pfumvudza for household food and nutrition security
6. Promote use of organic and bio-fertilizers to replace inorganic fertilizers. Use of organic fertilizers should be accompanied with farmer training on proper fertilizers treatment to enhance quality
7. Farmer Field Schools (FFSs) are recommended to experiment on different types of organic fertilizers. This will provide technical guidance and a drive towards full agroecology where mineral fertilizers are replaced by organic fertilizers
8. Building stronger synergies with Foundations for Farming to address technical aspects relating to Pfumvudza plots production.
9. There is need for systematic and standardised data collection to allow detailed analysis of Pfumvudza performance under different conditions.
**RESULTS**

**YIELD**

During the piloting of the Pfumvudza plots in 2019/20 season within LFSP districts, there were some instances in which recommended specifications were not adhered to. This reduced the yield potential of the practice, although this remained much higher than conventional practice. Farmers who followed the recommended practices achieved an average of 7.8 tonnes per hectare, guarantying household food security for 33 weeks. The performance of Pfumvudza thus points to the huge potential to turn around the food security status of rural households and indeed the whole country.

Farmers who practised Pfumvudza, applying the different practices to varying degrees and those that followed the full recommended Pfumvudza practices obtained higher yields in comparison to the national average yields as shown in table below.

![Comparison of performance of Pfumvudza](image)

**Mulch effect on yield**

The importance of mulching is all too clear across the clusters. Farmers who mulched their crops realized significantly higher yields than their non-mulching counterparts. Dead mulch performed best, followed by live mulch. Applying mulch before planting led to significantly higher yields than when applied later. Use of live mulch did not only enhance maize productivity, but also provided a diversified food basket from pulses and curcurbits (pumpkins and squashes). This also contributed to household nutrition security. It is also important to note that green mulch is more practical given the shortage of dry mulch in most areas.

![Mulching Performance](image)

Although generally live mulch seems to be providing reasonable crop performance in the Pfumvudza plots, further analysis shows that different plant species provide different results. Current evidence suggests that trailing cowpeas and velvet beans provide the best performance. Trailing cowpeas had a better mulching effect than the bushy type. Midlands was particularly exceptional in promoting live mulch and the results were very encouraging.
**HOUSEHOLD FOOD SECURITY**

To provide a practical context, the graph below shows the number of weeks that a six member household would be sustained with grain under different mulching practices in the Pfumvudza plot, holding everything constant.

**FERTILITY MANAGEMENT**

Although we had limited data on fertiliser use, indications seem to point towards the following:

* A combination of organic and inorganic basal, and inorganic top dressing fertilizers produced the best results.

* Use of organic fertilizers only was low and negligible and so could not be evaluated.

* There was no profound relationship between rate of fertilizer application and expected/achieved yield.

**RAINFALL**

The data shows a weak relationship between rainfall and yield leading to several possible explanations.

With a correlation coefficient of .4 rainfall remains important but the graph above shows that the relationship is not very strong. Evidence suggests that despite rainfall, mulching has a stronger effect on yield.
The recommended use of mulch (timing and soil cover) produced high maize yields in areas where cumulative rainfall was low. This goes to show the potential of Pfumvudza, and particularly the significant role of mulching in ensuring high yields under adverse moisture regimes.

**RETURN ON EAS INVESTMENT**

The Pfumvudza model does not only have potential to improve the food security of rural households but also provides reasonable return on investment. Preliminary calculations based on the yield performance of the pilot Pfumvudza plots under the programme revealed that for every British Pound that the programme invested in extension and advisory services towards the Pfumvudza model, the incremental value of the grain produced is £9.2. In other words an investment of £1 produced outputs worth £9.2. The incremental production alone can provide enough grain for almost four months for a family of six.

Thus Pfumvudza is not only very effective in addressing food insecurity but also provides the most efficient way of utilizing resources in the fight against hunger and indeed poverty.

**2020/21 SEASON**

Buoyed by the encouraging Pfumvudza performance in the 2019/20 season, LFSP continued implementing the concept in 2020/21 targeting 50,000 farmers across the three clusters. The farmers were capacitated to apply all the Pfumvudza practices incorporating agroecology elements. The successful pilot implementation of Pfumvudza in 2019/20 season that brought promising results contributed to the widespread adoption of Pfumvudza as a government supported food security program during the 2020/21 season. The recommendations from the 2019/20 Pfumvudza performance results were taken on board and the following improvements were made in 2020/21

1. **Foundations for Farming** was engaged by FAO to train and equip extension service providers under LFSP (Agritex Crop and Livestock Extension Workers (CLEWs), community based extension providers (Community Based Facilitators (CBFs) and Lead Farmers) and implementing partner Field Officers) with hands on skills on the Pfumvudza concept, capacitating them to cascade training and technical support to other community based extension providers and farmers.  
   • 541 extension providers received hands on training on various aspects of Pfumvudza. The training was conducted at the 28 demonstration sites established across the clusters  
   • The demonstration plots served as training sites to practically demonstrate how to grow alternative cover crops (velvet beans, cowpeas, lablab, sunhemp) and small grains (white sorghum, red sorghum, millet and sunflower) using the Pfumvudza concept

2. Despite the program’s efforts to promote the use of mulch, its availability remained a challenge for most farmers. Lack of mulching was however compensated for by the high rainfall received during the season. However, the risk of yield loss in un-mulched plots remains a threat especially in a typical season characterised by poor rainfall. Whilst farmers planted cover crops for use as live mulch, its use still remains low. Farmers need to take advantage of the abundant vegetative matter following the good rains received during the 2020/21 season and store mulching material for the coming season

3. In line with agroecology and nutrition sensitive agriculture LFSP supported 31,228 farmers with various subsidised seed types (Vitamin A Orange Maize, sorghum, millet, cowpeas, velvet beans and sunflower) for production under Pfumvudza plots.

4. The application of organic fertilizers in the 2020/21 season has been higher. Farmers also top dressed with liquid organic manure, which came in very handy given the incessant rains received during the crop’s development and the attendant water logging and nutrient leaching challenges

5. The Pfumvudza Impact Study: With so much support and publicity of Pfumvudza, it became necessary to commission an impact study that looks at the extent to which Pfumvudza provides cereal security to farming households and ultimately food security to the whole country. The Pfumvudza Impact Study is being conducted through the collaboration of FAO, Indaba Agricultural Policy Research Institute (IAPRI) and the Ministry of Lands, Agriculture, Fisheries, Water & Rural Resettlement with the technical support of a panel of experts within the Impact studies community in Zimbabwe.

**CONCLUSION**

Given the performance of Pfumvudza during the 2019/20 pilot season followed by the wide adoption by government as the Climate Proofed Presidential Input Support Scheme, there is scope to further improve the approach. There is scope to infuse more agroecology practices into the Pfumvudza approach to make it truly low external input sustainable agriculture given the adversities of climate change and the harsh macroeconomic environment. Pfumvudza also needs to be more nutrition sensitive, and this can be achieved by including other nutritious crops such as vitamin A maize, high iron beans, orange fleshed sweet potatoes and high iron pearl millet. Leguminous crops such as velvet beans, cowpeas and lablab need to be also be incorporated in Pfumvudza as food/feed crops and live mulch. These crops enhance soil fertility through nitrogen fixation, and also serve as livestock feed. Foundations for Farming has already trained some extension personnel on the production of these nutrient dense and leguminous crops under Pfumvudza. The trained extension personnel can cascade the training to fellow extension agents who would ultimately train the farmers.