ANALYSIS OF SMALLHOLDER COFFEE FARMING SKILLS NEEDS IN ZIMBABWE: IMPLICATIONS FOR TRAINING MODEL DEVELOPMENT

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ABSTRACT
The purpose of this study was to explore the level of Coffee growing skills that smallholder farmers in Honde Valley Zimbabwe possess. This was motivated by the fact that literature on smallholder coffee farming in Zimbabwe did not cover much on skills development. More so, exploring the initial levels of skills is a critical stage of any contextualized training program. A qualitative ethno methodology research design was adopted. Purposive sampling was used to collect data from, five public extension workers, two private (NGO) extension workers and fifty-seven coffee farmers through a questionnaire, participant observation and interviews. Documentary analysis was done to get historical data on coffee growing skills development programs for the farmers. The study found that: there is no formal college specializing in coffee farming. Smallholder farmers growing coffee in Zimbabwe have low levels of commercial coffee farming skills limited to land preparation, planting, weeding and picking. Farmers acquired the skills through informal training by commercial farmers, learning by doing during employment at commercial coffee estates, formal training by NGOs, peer knowledge sharing, observation and practice at own farm with parents. They lack knowledge of coffee varieties, seedling production, coffee pests, ideal growing conditions, hulling, grading, processing and marketing. The skills gap makes it difficult for the farmers to grow coffee as community groups independent of farming agents. It ties them to foreign agents who strip them of their profits. The study recommends a formal participatory skills development model in which farmers are provided with theory in practice skills for different coffee varieties, from coffee nursery to a cup.

Key Words: Small-holder farmers, Coffee, Skills development, Zimbabwe.

1. INTRODUCTION

Can I bring Coffee or tea? This is the buzzy question that every restaurant barista and waiter in Manicaland, Zimbabwe is conditioned to ask. Coffee as a noun refers to a beverage served on breakfast, after lunch or after dinner. Mlandu (2017) suggests that, many people cannot survive without a cup of coffee in the morning. We hope it is not the negative side of addiction. Burke (2018) declared Coffee to be life. Chrystal (2016) ranked coffee the second-most traded commodity after petroleum in the world. Coffee is a commercial export crop mainly produced in developing worlds. Its' major consumers are the US and Western Europe. In fact, coffee's popularity as a stimulant beverage and its demand the world-over is the strong basis for the need of this training needs analysis.

According to National Coffee Association of USA (2014), no one knows exactly how and when coffee was discovered, though there are many legends about its origin. The genesis of Coffee grown worldwide can be traced back to Africa. Its heritage stretches back centuries to the ancient coffee forests in the Ethiopian plateau. Mlandu (2017) suggests that a goat herder Kaldi, noticed that his goats became hyperactive after eating coffee red barriers and was convinced that, coffee red barriers were an effective stimulant.

Kaldi gave the coffee beans to some Monks who threw them in the fire in disgust, for total destruction. As the beans burnt they produced a very nice aroma. The Monks raked the roasted beans from the embers and threw them in water to cool. They noted that, the water changed color and had a sweet aroma scent. They ground and dissolved the red berries in hot water and discovered that it was a nice drink. That was the first recorded coffee processing and the world's first cup of coffee without sugar and milk. Why the Monks put the roasted beans in hot water, is not clear. The result was that, coffee became a beverage for human consumption. Monks found that, coffee kept them awake for long hours of prayer. One can conclude that, coffee's ability to keep monks awake and concentrating on prayer facilitated its infiltration in monasteries as part of their essential beverage at breakfast and dinner.

Today Ethiopia is Africa's major exporter of Kaffa and Sidamo beans, known as Arabica. The quality of Arabica coffee is ranked very high the world-over. Coffea Arabica, which was identified by the botanist Linnaeus in 1753, is one of the two major species used in most production. Presently, coffea Arabica accounts for around 70 per cent of the world's coffee. It is so popular, and millions and millions of people around the world start their day with coffee (Burke, 2018). The demand for coffee is higher than its' supply. This natural economic problem, called for this study which seeks to increase coffee production by community farmers in Zimbabwe. They have the land and humid conditions but limited technical know-how to grow the crop as an economic venture.

Ideally, coffee should be grown in moist, fertile, well-drained soils under a shaded canopy that receives a healthy dose of sunshine each day. The presence of disintegrated volcanic rock with a rich mixture of decomposed mold can have an extremely advantageous effect upon the vitality and prosperity of the tree. Coffee tends to grow well in other types of soils such as clay or alluvial. Coffee also seems to grow best in high altitudes, due to the conditions that these altitudes provide rather than a specific altitude preference of the tree itself (Wondering Goat Co; 2018).

Although Zimbabwe does not have a history of volcanic eruptions, it has ideal climatic conditions and good soils to grow high quality coffee (*Coffea Arabica*). In fact Zimbabwe has the potential to grow Coffea Arabica that could compete very well anywhere in the world.

Zimbabwe is divided into five natural regions, differentiated by the amount of rainfall, flora and fauna as well as soil types. Mutasa district in Manicaland province of Zimbabwe, falls under natural region one (1). This region is characterized by annual rainfall of more than 1000mm which falls throughout the year, low temperatures, high altitudes and steep slopes. Humidity for

such areas depends on the rainfall, ground cover and slope drainage. These are naturally ideal conditions for coffee growing.

Smith (1985) locates documented history of coffee in Zimbabwe, to 1853 when Chief Sekeletu, gave David Livingstone coffee beans to promote trade and commerce. Then those who followed Livingstone's discoveries expanded locations for coffee plantations in Zimbabwe. The crop used to be grown by big commercial farmers since its introduction for commercial purposes in the country around 1960 till late 1990s into 2000. Smallholder farmers were not considered as a coffee growing statistic then. Coffee was introduced around 1982 in Honde Valley.

Today (2020), Coffee plantations are mostly in the Eastern Highlands districts of Chipinge, Chimanimani, Mutare and Mutasa. Before independence, there was also significant production of coffee in Mashonaland West (Mhangura and Karoi), Mashonaland Central (Guruve) and Mashonaland East (Arcturus). According to Technoserve (2017: 23) there are 400 households that depend on coffee farming for their livelihoods in Manicaland now. The other parts of Zimbabwe, namely Mashonaland East, Central and West have resorted to maize farming rather than coffee. One can associate coffee production with appropriate hillside farms where other cash crops cannot be easily grown. If Zimbabwe is to claim a share for coffee production in the world, it must prioritize community farmers' coffee production skills development in Manicaland, specifically Honde Valley. It is found between Mount Inyangani and the Eastern Highlands ranges within Zimbabwe's agricultural region one.

Mugandani et al (2012) notes that natural region one in Zimbabwe is ideal for intensive agriculture. Common crops are coffee, tea, deciduous fruits such as apples and bananas. Horticultural crops such as tomatoes, potatoes, peas and vegetables can also do well. In Zimbabwe, the rainfall and agricultural activity decrease as one moves from region one to region five. Region one has more rainfall and region five has the least. Zimbabwe's rainfall is mainly relief rainfall, as such its' amount decreases as one moves from the Eastern highlands to the interior Mashonaland West and Matabeleland. One can also associate Manicaland's high rainfall with active coffee growing.

Important natural factors for coffee production are rainfall and temperature. Temperatures between 23 to 38 degrees Celsius are the most suitable for optimum coffee growth. Rainfall between 1,500mm to 2,000mm per annum is sufficient for a very good crop. It is very hot in Honde Valley from September with temperatures as high as 30^0C. In a normal year the valley receives an annual rainfall of around 1,200mm. This level is ideal for coffee production.

The Honde Valley in Manicaland, is a stretch of rich deposits of alluvial soils between a highly mountainous stretch of the border between Nyanga and Mutasa district to the border with Mozambique. It is situated some 90 kilometers away from the eastern border town of Mutare. Compared to other rural communities in Zimbabwe, the eastern highlands is most suitable for coffee production as it has the right climatic conditions that favor coffee production.

Being a valley, Honde enjoys free flowing water from the mountains. The majority of homesteads on the slopes have access to this water. Farmers are able to channel the free flowing

water to their fields and use it for irrigation. Zimbabwe experiences a long dry spell that runs from May to late November. During this period, coffee production is made possible by abundance of canal irrigation water. The only challenge for smallholder farmers is to develop efficient irrigation systems to supplement rain water. Natural water harnessing is one of the tasks to be included in the training of coffee farmers' curriculum.

Scoones (2014) suggests that smallholder farmers in Zimbabwe remain in problems because they lack skills to grow crops commercially due to extension service delivery which is low. Without a basic understanding of good agricultural practices, most smallholder farmers are failing to grow high quality coffee for export. Skills development is very important in supporting agriculture as the backbone of rural economy in Zimbabwe. In this case lack of skills is attributed to poor extension services delivery.

Wernau and Whelan (2018) notes that world coffee prices have been stuck below the cost of production since early 2000. The duo suggests that smallholder farmers need to be equipped with skills to be able to minimize their production costs and maximize profits. Unfortunately, they did not identify the level of skills farmers have and their training needs. In this case, the skills are not defined, but the implication is that without the right set of skills, farmers will not succeed in their farming business. Minimizing production costs requires farmers to have a wider range of skills such as knowing the right variety to grow, crop planting plan, right inputs, crop management, irrigation, pest and disease control as well as post-harvest handling among other aspects of production.

Mandirahwe (2016) observes that many players including non-governmental organizations (NGOs) make efforts to provide information and develop the capacities of coffee farmers in Mutasa district. SNV (2011) argues that the projects being implemented by many NGOs in Mutasa district are not yielding results as they are not well coordinated and are coming as piece meals to farmers. Technoserve (2017) concludes that smallholder coffee farming in Honde Valley is miles away from reaching sustainable commercial levels. Mandirahwe (2016)'s observation can be interpreted to mean that models being used by different organizations are not effective. The explanation by SNV(2011) that the programs lack coordination points to the fact that there is need to have a skills development model that protects the environment and natural resources as well as provide social and economic welfare to the present and subsequent generations. It must be replicable and relevant to raise smallholder farmers' skills and technical competencies.

Md. Ataul et al (2014) considers commercialization as a complex issue defined in various ways. They argue that agriculture commercialization is different from agriculture marketing. Pingali (1997) cited by Md. Ataul et al(ibid) affirms that commercialization is attained when household product choice and input use decisions are made based on the principles of profit maximization. Supported by Leavy and Poulton (2007), Abdullah et al (2017) all proposes that commercialization lacks clarity in its meaning and may result in misconceptions. Abdullah et al (2017) further explains that commercialization can occur either on the output side with increased market surplus or on the input side with increased use of inputs. The study is interested in both sides, use of inputs and the output side.

At the farmer level, commercialization is mainly influenced by agro climatic conditions and farmer's risk management ability. The study contributes to the development of farmers' risk management skills. Jaleta et al (2009) have a host of factors including: access to infrastructure and market, resource endowment of community and household, nature of farming institution and law, social and cultural factors affecting consumption preferences and production. Their effects on coffee farming in Zimbabwe have not yet been verified due to ecological variations. The authors point to the need for skills development as a key in attainment of sustainable coffee commercialization.

Eugine et al (2016) is adamant on the fact that for commercialization to happen, the skills of small scale farmers need to be upgraded. Developing skills in agriculture may help curb the productivity issue, which in turn would make agriculture more profitable if a minimum of market infrastructure exists. There are many opportunities for smallholder coffee farmers to get involved in parts of the agricultural value chain which needs to be explored.

1.2. Research Problem

This study is motivated by the observation that smallholder coffee growers in Honde Valley Zimbabwe possess low coffee growing knowledge and skills. Technoserve (2017: p 47) register that, coffee productivity is as low as 300kg of green coffee per hectare instead of the anticipated commercial levels of 2000kg per hectare. Honde Valley has the best climatic conditions for coffee production in Zimbabwe. It had more than 300 small scale coffee growers by 2019 who produced an average of only 5 metric tons of green coffee. Its neighbor, Chipinge with only 50 farmers produced approximately double as much. Technoserve (ibid) argues that with the right skills farmers in Honde Valley should be producing ten times their current level of production. According to Mandirahwe (2016) there is lack of extension services in coffee farming in Honde Valley. Government extension service delivery is centralized and does not cover many farmers who need training and technical assistance on coffee farming. Farmers acquired coffee farming skills through participant observation as farm workers or trial and error or trial and success. One also infers that, farmers did not receive comprehensive training in coffee production with a commercialization lenses. This study seeks to establish the coffee growing skills that farmers have as a basis for their training programs.

1.3. Research Questions

This study seeks to answer the following pertinent questions:

1. What coffee farming skills do smallholder farmers have?
2. How did they acquire the skills?
3. What are the coffee farmers' training needs in Honde Valley?
4. What sought of skills training model can be applied to develop coffee farmers' skills?

1.4 Research Objectives

The overarching objective of the study is to come up with a commercial farming skills development model for coffee farmers in Honde Valley. To achieve this overarching objective, the study seeks to;

1. Identify the skills smallholder coffee farmers in Honde Valley have.
2. Establish how the smallholder farmers acquire coffee farming skills.
3. Establish the training needs of the smallholder coffee farmers in Honde Valley.
4. Develop a commercial coffee farming skills development model for smallholder coffee farmers in Honde Valley.

1.5 Significance of the Study

This study derives its significance from the fact that it is probably, the first to specifically focus on commercial coffee smallholder farmers' skills training needs in Honde Valley Zimbabwe. There is no coffee farming school in Zimbabwe. The school curriculum only names coffee as a commercial crop. The study contributes significant literature on smallholder coffee farmers training needs. Its ripple effects are expected to increase coffee production by smallholder farmers thereby contributing to their economic development. This study contributes to human capital development. Specifically, it contributes the development of small-scale farmers' skills in coffee production.

2. STUDY METHODOLOGY

2.1 Research Design

The study was guided by the pragmatist philosophy. It facilitates the application of whatever methods are able to detect smallholder farmers' level of coffee farming skills. Qualitative design was used to explore the skills possessed by the smallholder coffee farmers. Qualitative research facilitates the application of a combination of methods to build a holistic picture. Specifically qualitative methods enabled the application of surveys, participant observations and in-depth interviews. Researchers were key instruments for data collection. The field environment was able to speak and our knowledge of participants were rich contributions to data analysis and interpretation. Quantitative methods were critical for surveys, data presentation and exactness. Also a quantitative perspective required the researcher to be neutral and practical. Qualitative approaches permit an open approach to allow for surprises or new findings to be cooperated. A case study was fused into the data collection to get a deeper understanding of the coffee farmers' level of skills and training needs. According to Yin (1998) case study research design has the ability to investigate cases in depth and to employ multiple sources of evidence.

2.2. Data Collection Instruments

The main instrument used by the researchers was a five item questionnaire designed for the study purpose. The majority of farmers are literate and able to understand and record their views. This instrument captured farmers' age, level of education, coffee farming skills and how they acquired them. Open-ended questions allowed farmers to articulate their experiences and raise

insights for researchers. Khotari (2004.p108) encouraged us to obtain primary data through direct communication with respondents in one form or the other.

The other instruments were the interview and observation guide. Interview guides captured explanations to enrich researchers' in-depth understanding as required by (White, 2005). Observation guide identified how farmers actually grew their coffee. They were critical sources for inferring the actual levels of farmers' skills.

2.4. Population and Sampling

The population of this study was composed of 400 smallholder coffee farmers in Honde Valley. According to Khotari (2004) this type of a population is finite whose total is known. Khotari (2004. p192) recommended a large sample (30 < n) for the variable to be normally distributed and findings generalized. In this study a purposive sample fifty-seven farmers. They were selected on the basis of being smallholder coffee farmers (possessing the variable hence rich sources) available and willing to participate in the study. Government and NGO workers were selected on the basis of being the only participants in that group.

2.3 Validity and Reliability

The first step to ensure validity of the findings of this study was to triangulate data collection methods (survey, observation, document analysis and interviews). The second one was to use appropriate tools and collecting data from the field. That allowed data to be collected without disturbing the farmers routine tasks. I involved experienced and well trained two research assistants in data collection. This was to ensure that appropriate and accurate data was collected. The fourth source of reliability is the active involvement of the participants at all stages of data collection. Farmers were made aware of the purpose of the research and its significance to their farming business**.** Another researcher was in cooperated to reduce the error of researcher familiarity.

The fifth one is that all the documents analysed were structured for the study and pilot tested. I believe that all the documents I reviewed were authentic and credible. For example, coffee sales exports report generated by Zimbabwe Coffee Mill. These reports are assessed by the central bank of Zimbabwe. Documents from the government extension offices were stamped with the government official stamp and no obvious errors were found.

2.5. Data Collection

Data collection was initiated by seeking permission from Nespresso, the company funding the study. This is an ethical observation which also lobbied for their support. A pilot study was carried out at Muriel mine coffee farm. Instruments were perfected on the basis of corrections and the nature of answers.

2.5.1.Surveys

Researchers and trained assistant researchers introduced themselves to each selected household where coffee was grown. We requested for their contribution and participation in the study. A questionnaire was left at each of the household where the farmers accepted to participate. These were collected after three days.

2.5.2. Participant Observation

Greater part of data for this study was collected through participant observation. Researchers were actively involved with the farmers from June 2018 to December 2019 for data collection. The time frame is long enough to allow events to unfold naturally and make meaningful interpretations. Observations helped us to understand farmer's capabilities, behaviors, perceptions, limitations and expectations. The period was long enough for us to be able to validate the response given by participants during interviews and questionnaire administration. We easily related to their way of coffee farming.

We were allowed to record utterances, strategies, practices and beliefs. We had the chance to visit the majority of the farmers in their fields at least twice. We also had focus group discussions with coffee buyers from the international community where concerns were raised on poor coffee farming techniques by smallholder farmers. Focus Group Discussions captured group perceptions of factors influencing their payment of farmers' coffee. We also had focus group discussions with government extension officers in the area and held informal interviews with them on the level of competency for the smallholder farmers in growing coffee at commercial standards.

2.5.3. Interviews

Informal interviews were done to capture information that could not be accessed through observation and survey. Interview answers helped us to seek clarifications on issues raised by farmers, coffee buyers and extension workers. It was important for us to triangulate interview data with that collected from observations. We used a voice recorder to capture some of the responses with the consent of the respondents as advised by Sekeran (2013). The audio was played back to the respondents for avoidance of doubt and suspicion and more important to verify the accuracy of recorded data. The main questions asked during interviews are:

1. How long have you been growing coffee?
2. What skills do you have in coffee farming?
3. How did you acquire coffee farming skills?
4. What coffee farming skills would you require training?

2.5.4. Document Analysis

Documentary analysis focused on records of coffee export sales, production volumes, training modules, NGO programs proposals and extension support schedules were reviewed. We were guided by Grix (2001) who noted that documents are written for a purpose, with certain

assumptions and presented in a certain way suitable for the targeted audience. Our document analysis guide focused us on: the purpose of the proposal or training manual, the target population, content of training and evaluation. Tallying document analysis findings with farmers' responses on the nature of training they got and their needs, reflected training needs that this study was after.

3. RESULTS AND DISCUSSIONS

3.1 Participants' Age Distribution   n = 65

STEM	LEAF													
2	7													
3														
4	0	0	1	5	6	7	8	9						
5	0	1	2	2	3	4	5	5	6	7	7	8		
6	1	2	2	4	5	5	6	7	7	8	8	9	9	
7	0	1	3	3	3	3	4	5	6	7	7	8	9	9	9
8	0	1	2	2	5	6	7	7	8	9	9			
9	3	5	5	6	7									

KEY: 5 7 = 57

The table shows that, all participants were adults whose responses can be relied upon. There is one outlier who is 27 years old. This was the youngest coffee farmer. The majority of the coffee farmers are between 70 to 79 years old. Many (68%) of the farmers are above 60 years old. These are now a bit old for them to be keen to learn new methods of farming coffee. The mode is 73 years. The participants' ages are negatively skewed. The skewedness can be attributed to the land reform program in which these old people got land on the ticket of having participated in the liberation war. The distribution is unhealthy for the sustainability of coffee farming because of the current break in the 30 years age group.

Interviews showed that, participants are into coffee farming because they have no other form of employment. In Zimbabwe, the retirement age of farm workers is 60 years. The age distribution shows that, 68% of the coffee farmers are beyond the retirement age.
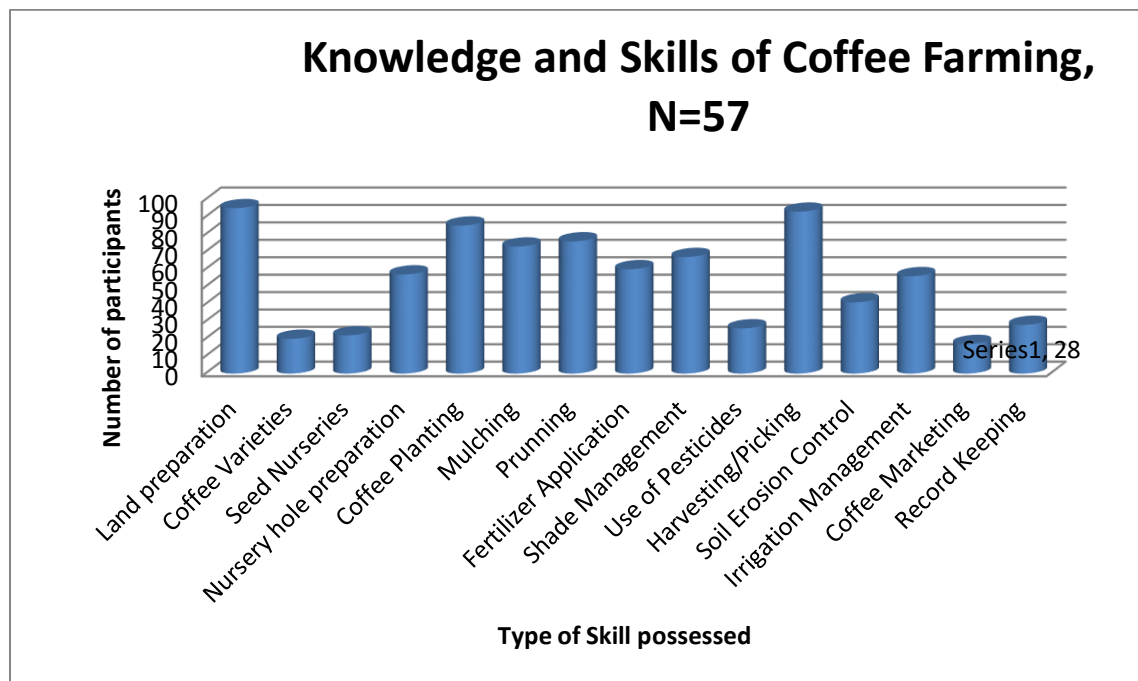
Participants have good skills (above 60%) of coffee land preparation, harvesting/picking, planting, pruning, coffee plant mulching and shade management. Almost all (93%) of the participating coffee farmers reported that they can prepare land for planting coffee. This is probably because respondents understood land preparation in this case to mainly mean clearing and digging the land. These are mainly skills that farmers learned through on the job training as coffee farm workers. Their skills are lacking (below 20) in coffee varieties, seed nursery management and marketing. These are skills that are mainly required during farm planning.

Interviews and Focus Group Discussions revealed that, farmers bought coffee seedlings from a few who were in the business of seedlings. Farmers were not aware of different varieties of coffee because they were not exposed. Those who prepared seedlings only had one variety of Coffee Arabica. Knowledge of the performance or characteristics of different coffee varieties is a very critical skill in commercial coffee production. Coffee varieties perform differently in terms of productivity, pest and disease tolerance.

Interviews and focus group discussions revealed that: farmers have no skills in integrated pest and disease management. They were unable to name coffee pesticides. Farmers are therefore running a big risk in their business. They can grow varieties that have low resistance to pests and disease and on the other hand they do not have the knowledge to manage them

Farmers revealed that they had no need for marketing skills because they always sold their coffee to middleman or coffee millers who determined the coffee beans grade and price. The market was always there for them. We inferred that, their lack of exposure to the market compels them to accept what-ever grade and price they were offered by coffee buyers.

Records available only showed planted hectors, harvest and income that they got. There was nothing much on the dates of planting, fertilizer applied, growth rate and pesticides. We concluded that, the nature of training that farmers got produced effective cheap laborers and not independent coffee farmers.

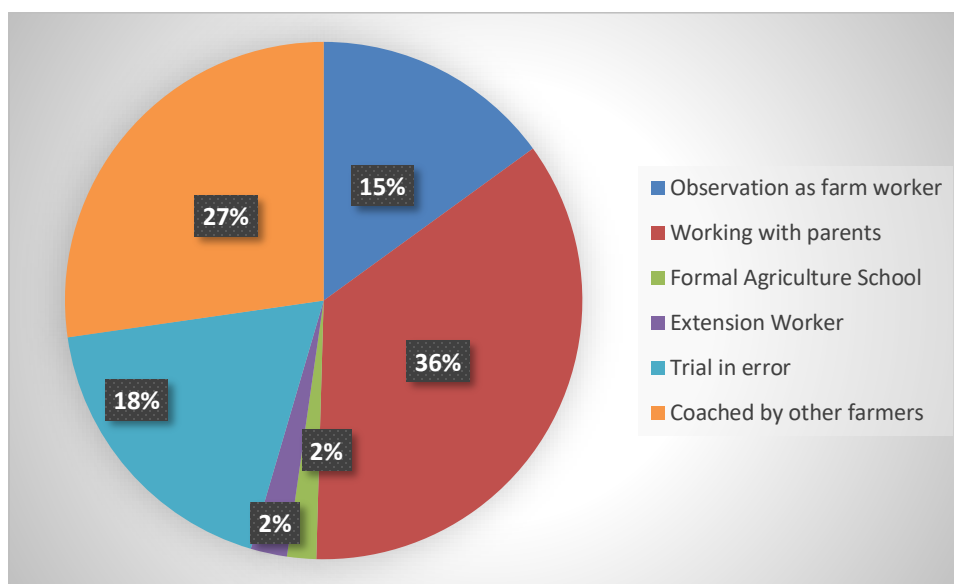**How coffee farming skills were acquired N = 57**

Figure 3 above shows that the majority (36%) of the farmers acquired coffee farming skills through working with their parents on the farmers. We can call this parent –child skills transfer. The danger with this method is that if the parents learnt wrong methods or outdated technologies, they are being passed to generations until a time when the whole family is outdated.

A significant number (27%) acquired coffee farming skills through other farmers. The power of peer –peer education should never be undermined. This can suggest the application of train the trainer cascading model of skills development.

Some farmers (18%) were learning by trial and error or trial and success. This ingredient justifies the need for farmers to be allowed to take risks. They can have their coffee plots for practice. That is a critical component of a hands on strategy to satisfy "I do and I learn". Errors and mistakes here are rich sources of learning. We got (15%) of the households reporting that they acquired coffee farming skills through working for commercial farmers or government estates. These are informal apprenticeship methods.

Very few (2%) attended formal school on coffee farming at Magamba skills development Centre. Only 2% gained knowledge from the help of government extension workers. These findings are in support of Chirwa and Matita (2012) who appraised the role of traditional farming methods training in Malawi.

Table 1: Farmers' Knowledge on coffee Harvest processing   **N = 57**

Coffee Processing Stage	Frequency	Percentage (%)
Harvesting	51	89%
Sorting	27	47%
Pulping	57	100%
Fermentation	32	56%
Drying	31	55%
Hulling	2	3%
Grading	3	4%
Storage	21	37%

All the farmers reported that they know how to pulp their coffee while the majority (89%) also reported that they know how to harvest coffee. Very few (3%) know how to hull their coffee. More than half (56%) know how to ferment their coffee while 4% can grade their coffee. Coffee grading and hulling is mainly done indoors. Fewer workers were involved at this stage, hence the majority of farmers did not get the chance to be involved.
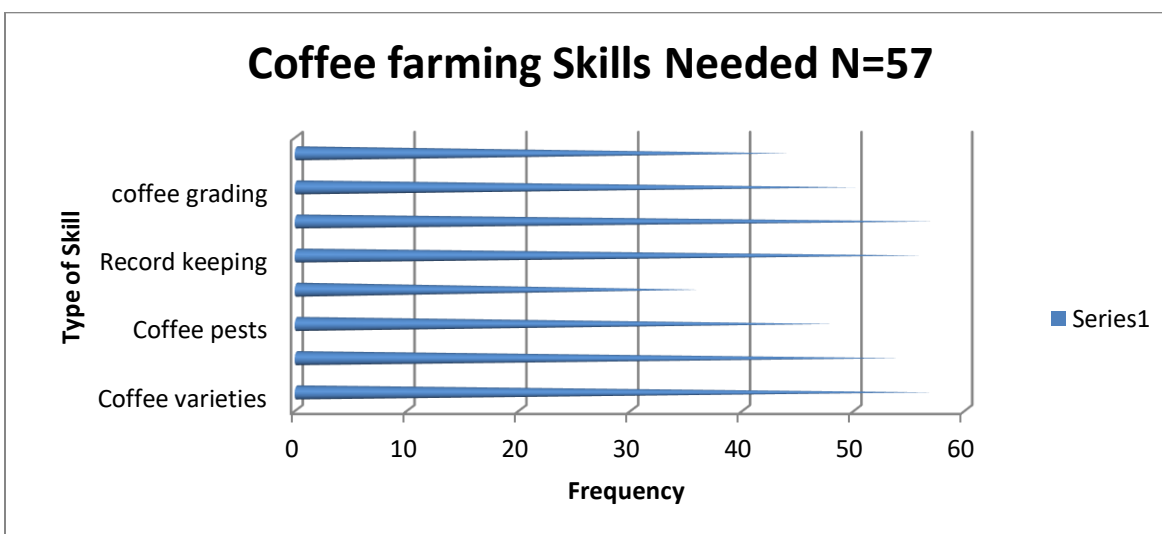
These training needs, according to Collet and Gale (2009) must form the basis of any adult skills training module.

4. CONCLUSIONS

This study found out that, smallholder farmers in Honde Valley have skills for coffee land preparation, planting, mulching, pruning and harvesting/picking. These are low ranking labour skills. They were acquired through working with parents, being coached by other farmers, participant observation as farm workers and through trial and error and trial and success. Given

the history of coffee farming in Zimbabwe we concluded that, on the job training that the farmers got was limited to producing cheap coffee laborers rather than independent coffee farmers. There was little or no skills transfer from the commercial farmers to extension staff or to farmers.

Very few (2%) had something about coffee farming talked about in Agriculture at school.

Farmers need knowledge of coffee varieties and their characteristics, coffee nursery management, coffee pests and how to apply pesticides, record keeping, and hulling, grading and coffee marketing.

5. RECOMMENDATIONS

These findings motivated the following implications for smallholder coffee farmers training:

1. Youth (20 to 35year olds) can be recruited into coffee farming by offering them land and loans for coffee farming. These have a higher potential to learn new knowledge. Their inclusion ensures continuity of coffee farming in Zimbabwe.
2. A participatory coffee farming skills development model whose curriculum includes:
   - Coffee varieties and their characteristics
   - Coffee Nursery or seedling production and management
   - Coffee pests, pesticides and their safe use and handling
   - Coffee pests control using indigenous methods
   - Record Keeping
   - Coffee Processing (harvesting, pulping, fermentation, grading, hulling and storage)
3. Technoserve can establish a demonstration coffee field in Honde Valley. This is where farmers can learn by observation from expert demonstrators. Theory lectures and demonstrations can be held for coffee varieties. Fertilizer and pesticides manufactures can bring their products and demonstrate how they are used. The trained can train farmers in their clusters to allow transfer of knowledge from farmer to farmer.

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