Annual Outcome Survey of 4P Project; Traditional rice production as an agri-business to uplift livelihood of smallholder farmers

Final Report (2022)

Smallholder Agribusiness Partnership Programme (SAPP)

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Abbreviations

4Ps	Public-Private-Producer Partnerships
CAPI	Computer Assisted Personal Interview
CBO	Community Based Organization
Cm	Centimeter
FGDs	Focus Group Discussion
FOs	Farmer Organizations
Ha	Hectare
HH	Household
HHAI	Household Asset Index
IFAD	International Fund for Agriculture Development
IPID	Institute for Participatory Interaction in Development
Kg	Kilogram
KIIs	Key Informant Interviews
LFA	Logical Framework Analysis
LKR	Sri Lankan Rupees
M & E	Monitoring and Evaluation
NADeP	National Agribusiness Development Project
NGO	Non-Governmental Organization
NSB	National Savings Bank
OECD	The Organization for Economic Cooperation and Development
PMU	Project Management Unit
POs	Producer Organizations
RIMS	Result and Impact Management System
SAPP	Smallholder Agribusiness Partnership Programme
SME	Small and Medium Enterprise
SPSS	Statistical Package for Social Sciences
ToR	Terms of Reference

Executive Summary

Smallholder Agribusiness Partnership Programme (SAPP) is implemented by the Ministry of Agriculture with the financial and technical support from IFAD. The overall goal of SAPP is to contribute to Sri Lanka's smallholders' poverty reduction and competitiveness. The development objective of the programme is to sustainably increase the income and quality of diet of 57500 smallholder households involved in commercially oriented production and marketing system. The aim of the SAPP is to increase the incomes of the beneficiaries participating in the marketing chain development component by 20% -30% on an average. Through a combination of improved farm gate prices, improved on-farm productivity and participation in upstream value adding process, 57,500 households -will be supported under SAPP, providing access to rural financial services in a sustainable manner at affordable rates. Though, the SAPP has a national coverage, special attention and preference is given to low-income districts and areas where the potential for agriculture production is high. SAPP is comprised of 3 Programme Components; Access to commercial partnerships; Access to rural finance; and Programme management and policy dialogue.

Since 2019, SAPP has implemented a 4P project titled "Traditional rice production as an agri-business to uplift livelihood of smallholder farmers" located in Puttalam and Kurunegala District. Overall objective of the project is to establish economically viable and sustainable traditional rice-based agri-business for rice farmers which leads to sustainable agribusiness development among the selected farmers. Prior to implementation of this 4P project, the project has established baselines based on the M & E matrix of the project. The SAPP has considered outcome monitoring as one of the important Monitoring and Evaluation (M&E) activities to assess the progress of the project and review the approaches both quantitatively and qualitatively and commissioned IPID to carry out this Annual Outcome Survey (AOS). The overall purpose of this survey was to assess the progress achieved against the project interventions and provide quantitative and qualitative interpretations on specific indicators as reflected in the project M & E frame work and provide suggestions to the programme to improve project's support to achieve targeted outcomes during the project implementation period.

The IPID consultants gave more emphasis for the indicators in the M & E matrix of this 4P project to review the achievement of the intervention. A combination of Desk Review (DR), household survey (HHS), Key Informant interviews (KIIs), Focus Group Discussions (FGDs) and field visits were used as the key data collection tools as described in the outcome matrix. M & E matrix of the tomato project consists of 29 indicators, out of which 6, 14 and 9 are respectively at goal level, outcome level and output level. This is considered to be a comprehensive set of indicators that can measure the project results at every levels appropriately. Accordingly, the consultants assessed the achievements of the indicators in comparison to the baseline situation. Results of the goal and outcome indicators are shown below.

S. No.	Indicator	Baseline	AOS	Results
1	Improvement in assets ownership (Household Asset Index)	56.03%	57.74%	3% Increase
2	Total number of HH receiving project service by gender		110	110 (34% Women)
3	% of supported HHs reporting an increase in monthly income by 20 -30 % by gender	No baseline HH data available		
4	% of increasing average monthly income	LKR 29,446	LKR 35692.38	21.23% increase
5	% of increasing average monthly income from traditional rice cultivation	LKR 8401.42	LKR 12129.51	44.37% increase
6	% Increase in average yield of traditional rice (kg/ac)	LKR 955.24	LKR 936.67	36.67% Decrease
8	% of increase in average production of traditional rice /HH	1168.66 Kgs	1061.67 Kgs	9.15% decrease
9	% of HH reporting an increase in average production (70%)	Baseline from Memory Recall		41.66% increase
10	% Increase in volume of sale	968.05 Kgs	870.83 kgs	10% decrease
11	% Increase in value of sale	100817.07 LKR	145554.17 LKR	44.37% increase
12	% of HH reporting an increase volume and value of sale	Baseline from Memory Recall		25% increase
13	Number of farmers who involve in cultivation in traditional rice	110	110	
14	Average quantity of traditional seed paddy produced per year (2 seasons)	No formal seed paddy production		
15	% of reduction of postharvest losses	No records available		
16	% of HHs who practiced the parachute method for crop establishment	5%	5%	
17	% of farmers reporting that they receive better service from the project			54.8%
18	% of farmers reporting that they received assured market through the project			100%
19	% of farmers who sold their paddy to Parabowa	30.35%	100%	100%
20	Quantity of traditional paddy purchased from HHs per year (2 seasons) by company	140000 kg	270000 kg	92.86% increase

Conclusion

The project has fulfilled the requirements of 13 outcome indicators (out of 20). However, fulfilment of the beneficiaries' expectations and their satisfaction leaves much to be desired. Given the prevailing situation in the country during the project implementation period, the level of achievement of the expected outcomes is acceptable at some extent. As such, the project is rated as "Moderately Satisfactory".

Recommendations

- There is much need for improvement of the organic traditional rice productivity. To achieve the optimal yield level, beneficiaries must be further capacitated with necessary technical and practical knowhow through an intensive organic agriculture extension service.

- Production of quality seeds, organic fertilizers and pesticides is a specific process that needs much attention. This is an opportunity for young entrepreneurs to start an agribusiness that SAPP / POFO can guide.

- Other than the parachute method, SAPP must have introduced some cropping system like System of Rice Intensification (SRI) and motorized weeders so as to make parachute method more effective and popular

- The consultants recommend for SAPP to take extended efforts to further strengthen the organization capacity of the POFO and its regional network through a capacity building program.

1. Introduction

The Smallholder Agribusiness Partnership Programme (SAPP) is implemented by the Ministry of Agriculture with the financial and technical support from IFAD. SAPP works with selected smallholder farmers in Sri Lanka from 2017 to 2023. The overall goal of SAPP is to contribute to Sri Lanka's smallholders' poverty reduction and competitiveness. The development objective of the programme is to sustainably increase the income and quality of diet of 57500 smallholder households involved in commercially oriented production and marketing systems. The aim of the project is to increase the incomes of the beneficiaries participating in the marketing chain development component by 20% -30% on an average. Through a combination of improved farm gate prices, improved on-farm productivity and participation in upstream value adding process. 57,500 households will be supported under SAPP, providing access to rural financial services in a sustainable manner at affordable rates.

Smallholder Agribusiness Partnerships Programme (SAPP) aims to facilitate rural smallholder farmers in terms of building the commercial partnerships, providing access to finance, improving technical know-how and financial literacy, introducing mechanization to agriculture, and sustainable agricultural practices. The key driver of this programme is "Public-Private-Producer Partnerships" (4Ps) value chain model which brings public sector, rural smallholder farmers and private sector companies to a common platform where all the partners can develop their agribusiness towards a common goal of uplifting the rural farmer communities economically and socially and support rural economic development.

1.2 Programme Components

Component 01- Access to commercial partnerships: This component includes two sub-components: (1.1) Establishing 4Ps (new 4Ps, NADeP scale ups, 4Ps with POs/FOs); and (1.2) Institutional strengthening and capacity building of Producer/ Farmer groups (within a market-driven model). A total of 43,000 households will be directly reached through 4P schemes and institutional strengthening interventions. Rural youth will also be considered (no. of 2500) under this component to become entrepreneurs and to respond the demand for services generated along value chain complements in 4Ps.

Component 02 – Access to rural finance: This component consists of two sub components: (2.1) Financing of 4Ps; and (2.2) Institutional strengthening for the financial services sector. The sub component 1 is to provide credit through financial institutes to participants in 4P projects coming under component 1 and sub component 2 aims at strengthening financial institute through training and technical assistance.

Component 03 - Programme management and policy dialogue: This component comprises two sub-components: i) Program and knowledge management; and (ii) Policy

dialogue. Program and knowledge management sub-component is engaged with the smooth implementation of management, financial, administrative, and monitoring and evaluation of the program. Under policy dialogue sub-component, it supports activities aiming at improving the policy environment for equitable and sustainable smallholder farmer-sourced agribusiness development.

1.3 Traditional Rice Project

With the aforesaid objectives, the SAPP has been implementing a 4P project titled "Traditional rice production as an agri-business to uplift livelihood of smallholder farmers" located in Puttalam and Kurunegala District and providing grants, training and credits for implementing identified activities to achieve the set objectives of the project in line with objectives and expected outcome of the program. The overall objective of the paddy cultivation project is to establish economically viable and sustainable traditional rice-based agri-business for rice farmers in Kurunegala and Puttalam districts. This overall objective of the project expected to implement via following specific objectives:

- To promote traditional rice production to have marketable surplus adequate for a regular market.
- To produce minimum of 2.5 MT high quality seed paddy of selected traditional rice varieties as youth entrepreneurship as separate entity.
- To familiarize and adapt parachute method of planting for traditional rice to increase production.
- To minimize the post-harvest losses due to improper drying and sub-standard storage.

Prior to implementation of this 4P project, the ~~project~~ SAPP has established baselines covering socio-economic and demographic conditions, assets ownership, and value chain indicators including production, productivity, cost of cultivation, income, margins, value addition, (primary) processing, and market arrangements based on the M & E matrix of the project.

The SAPP has considered outcome monitoring as one of the important Monitoring and Evaluation (M&E) activities to assess the outcomes of the project and review the approaches both quantitatively and qualitatively. Therefore, the programme has planned to carry out the outcome survey of this 4P project with aiming at assessing the progress of outputs and outcomes of the project interventions. The SAPP foresees that the outcome survey results will further guide the project to review the implementation strategy and revisit if needed to achieve the expected output and outcome. Hence, SAPP has commissioned IPID to carry out this outcome survey. The study is expected to review the progress achieved so far, as against the established baseline for value chain specific and socio-economic indicators.

2. Objectives and the scope of the outcome survey

The overall purpose of this survey was to assess the progress achieved against the project interventions and provide quantitative and qualitative interpretations on specific indicators as reflected in the project M & E frame work and provide suggestions to the programme to improve project's support to achieve targeted outcomes during the project implementation period. More specifically, the outcome survey needed to achieve the following objectives:

- To measure the positive and/or negative changes/outcomes taking place on relevant indicators at the household/farmer organization /agribusiness level:
- To measure the significant changes of the function of traditional rice value chain: value chain development, inclusive business, gender and social inclusion, partnership in business (Productivity, production and processing), access to inputs / information / technology / infrastructure etc in line with in project proposal:
- To provide timely performance information so that corrective actions may be taken to implement the project activities, if required;
- To provide early evidence of project success or failure; and
- To provide the opinions on the achievements as felt by the direct beneficiaries of the project

The project indicators (M&E frame work) is given in **Appendix I.**

3. Scope of Work

This assignment was carried out under the supervision of the SAPP and was responsible to undertake the following tasks:

- Identify output and outcome indicators to be estimated and data to be collected to achieve the above said objectives through studying the project proposal, baseline survey report and M&E frame work for project monitoring and evaluation purposes as per LFA and RIMS
- Design a questionnaire adapting the standard IFAD RIMS (Result and Impact Management System) questionnaire to gather data
- Development of survey tools and train enumerators and pre testing the questionnaire
- Selection of sampled HH employing appropriate sample technique in compliance with project requirements and the IFAD's RIMS guidelines
- Conduct field visits and collection of data using pretested questionnaire

through face-to-face interviews

- Analyze data gathered through the survey in full compliance with SAPP Log frame & M&E matrix and the IFAD's RIMS guidelines to achieve the objectives
- Prepare final report, which document the findings of the survey as per format provided by SAPP
- Undertake digital mapping of all the households visited during the survey. (Not mandatory)

4. Approach and Methodology

A study has been conducted to assess the baseline situation of the traditional paddy cultivation project to provide information on prior status of the beneficiary communities and the value chain etc. The baseline report was available. However, it was revealed that the ~~baseline databases~~ household level raw data were not available in the SAPP PMU and the consultants were asked to find necessary alternatives to adjust with the scope of work based on available data and information. In reviewing the baseline report, the consultants identified lacking of important baseline data in the report that impeded the process of outcome survey though it seemed to be informative. Some baseline findings were not in line with the M & E matrix of this particular 4P project. It has disarrayed. Some findings are not reliable.

The consultants analysed the baseline report and found where some adjustments and alternatives are needed to carry out the outcome survey in line with the M & E matrix. Out of 20 outcome indicators, 9 indicators could not be measured with existing baseline information. Therefore, the consultants suggested necessary adjustments in the methodology as described in the results section of the report. Accordingly, the consultants gave more emphasis for the indicators in the M & E matrix and proposed following methodology to review the achievement of outcome indicators of M & E matrix of this project.

The study also obtained data and information to review the progress and achievements of the project implementation, to identify the gaps and lessons learnt and to make recommendations for adjustments or future projects. The data collection tools are developed based on the following OECD Evaluation Criteria since this study is planned to conduct an 'Outcome Evaluation' rather than an Annual Outcome Survey. As such, the following criteria were assessed.

- Relevance of the project - Is the intervention doing the right things?
- Coherence of the project - How well does the intervention fit?
- Efficiency of the project's interventions - How well are resources being used?

- Effectiveness of the project's interventions - Is the intervention achieving its objectives?
- Impact of the project's interventions - What difference does the intervention make?
- Sustainability - Will the benefits last?

4.1 Methodology

A combination of desk review, household survey, Key Informant interviews (KIIs), Focus Group Discussions (FGDs) and field visits were used as the key data collection tools.

4.1.1 Desk Review of Project Documents

The desk review served an important function in this assessment, providing a foundation upon which to build the subsequent steps. Desk review activities included scanning the literature, analyzing secondary data, and creating a reference list/ check list so that all project documents were organized and easily accessible to consultants. The comprehensive desk review of project documents understood the projects' context including progress of project interventions. It also identified key gaps and opportunities by analyzing available data and information.

4.1.2 Household Survey

Household survey collected data to measure changes that have taken place among beneficiaries over the implementation period. A structured questionnaire examined more on outcomes of the project. Accordingly, household data collection was more specific in line with the M & E matrix. The survey questionnaire is annexed in the appendix 2.

A statistically valid sample was calculated with ± 5% precision and 95% confidence level. In order to obtain the maximum sample size with the given 95% confidence, the estimates have been assumed as 50% of the sample calculation.

The sample size (56) had been already computed (Appendix 5) during the baseline study. According to the guidance given by RIMS, the Multi-Stage Sampling Approach was used to select the sampling points by the consultants who conducted the baseline study. IPID was provided the same sample by the SAPP to collect data. However, during the outcome survey, only 42 households were interviewed. Due to peak land preparation period in the season and some refusing to being interviewed, the survey team could not be able to interview 14 HHs in the sample. A structured questionnaire was administered via Computer Assisted Personal Interview (CAPI) method. KoBoToolbox was used as a tool of CAPI to create the data collection mobile application.

Data Collection, Coding, Cleaning and Back Checking: A comprehensive training session to three enumerators on the outcome survey objective, methodology and tools was conducted. Pre-testing of the mobile-based survey questionnaire was done prior to start

the quantitative survey. After pre-testing the data collection tool, the acceptable revisions were incorporated with the consultation of SAPP M & E unit.

The field data collection was constantly reviewed by the responsible persons in the senior research team of IPID. The IPID also performed field verifications to ensure that the proper respondents were interviewed, to checks that interviewers were following instructions, review record sheets to see they were completed correctly, assess whether data collection was proceeding on schedule, and constantly verified whether the correct sample size was achieved. IPID research team provided required guidance to the survey implementation field team throughout the survey on necessary technical matters, validation and quality assurance. The open-ended questions were coded with answers that were mutually exclusive, meaningful and consistent. Categories with very few responses were folded into a separate folder as 'other'.

4.1.3 Focus Group Discussions (FGDs)

FGDs were designed to explore in-depth information mostly qualitative on project relevance, efficiency, effectiveness, outcome/impact, lessons learnt and sustainability in relation to the project. The FGD guide is annexed in appendix 3. Accordingly, the following two (02) FGDs were conducted;

- FGD 1 – Key staff members (6 members) of the promoter who have been worked with the project
- FGD2 – Traditional rice farmers (15 farmers representing entire project target area)

4.1.4 Key Informant Interviews

KIIs provided a platform to obtain in-depth comprehensive information from relevant stakeholders such as Government representatives, policy makers, Community based Organizations, district / regional level representatives and community leaders. Key Informants were able to provide detailed information on marketing of traditional rice and value chain analysis and more. The interview guide is presented in appendix 4.

4.1.5 Field Visits / Observations

Observation as a research process offered the opportunity to gather live data from naturally occurring situations. Therefore, observation was one way to gather information directly on what has happened in this project rather than relying on second-hand information.

Qualitative Data Analysis and Interpretation: The qualitative tools designed for face-to-face interviews/discussions were tested with the agreed sampling points by the SAPP. KII data and FGD data were compiled simultaneously with the data collection. Data analysis was done by the Data Management Expert/ Statistician of IPID using Statistical Package for Social Sciences (SPSS). Mainly descriptive statistical analysis was done to interpret

survey results and did inferential statistical analysis based on the requirements of SAPP. Data analysis matched with the scope of the both baseline and outcome studies.

Indicators were measured as described in M & E matrix presented in Appendix 1. The asset index is any composite indicator such that the indicators on which it is based reflect an individual or a household's, ownership of a range of assets. In abstract terms, an asset index is any indicator Ai computed as a function of a set of variables aij, where aij denotes household i's ownership of asset j. $A_i = f(a_{ij}) = f(a_{i1}\ldots, a_{im})$. i.e., $A_i = a_{i1} + a_{i2} + \ldots + a_{im}$, where $a_{ij} = 1$ if household i owns asset j, and $a_{ij} = 0$ otherwise. The household Asset Index (HHAI) estimated in this study is based on household's facilities and assets, using Principal Component Analysis (PCA) method which was first used to combine socioeconomic indicators into a single index (Boelhouwer & Stoop, 1999). However, data triangulation was done by Data Management Expert to arrive at more accurate conclusions and recommendations.

4.2 Limitations and Risks for the Data Collection

Given the current fuel crisis, an extra time was required for preparation of the field and primary data collection as government regulations and situational circumstances in the country are vulnerable to rapid changes.

5. Findings

This section of the report presents the results of the outcome survey. Measurements of each indicator has been interpreted incorporating the qualitative information collected through FGDs, KIIs and field visits.

5.1 Goal level indicators

5.1.1 Improvement in assets ownership (asset index)

Since the household level baseline data was not available to calculate the % of HHs with improvement in assets ownership, average Household Asset Index (HHAI) of the total beneficiaries was considered to assess the assets improvement of the beneficiary households. The Assets index was constructed from the data on ownership of household durable goods using PCA (Principal Component Analysis[1]) following the methodology proposed by Rutstein et al (2004). All the variables used were dichotomized (1=yes; 0=no) and the prevalence of each household durable item was calculated. Then PCA was conducted based on correlation matrix and varimax rotation.

[1] Principal components is a technique for extracting from a set of variables those few orthogonal linear combinations of the variables that capture the common information most successfully.

Since the HHAI conceptually ranges from 0 to 100, houses and their conditions of these beneficiary farmers are relatively good (HHAI = 57.74). The higher the value, the better the house conditions and facilities. These houses equip with the basic requirements such as water and electricity. The conditions of the houses including floor, roofs and rooms are also relatively good. In comparison to the baseline situation where the asset index is 56.03%, this outcome survey has revealed that there is 3% improvement of the HHAI of the households benefited from the traditional rice project. Detail analysis of the HHAI is presented in the Appendix 6.

5.1.2 Total number of HH receiving project service by gender

Total number of HHs receiving project service are 110 farm families. Out of which, 34% project assisted farmers are women.

5.1.3 % of supported HH reporting an increase in monthly income by 20 -30 % by gender

This indicator could not be measured due to unavailability of baseline data at household level. Therefore, the consultants decided in consultation with SAPP M & E unit to measure % of increase average monthly income only.

5.1.4 % of increasing average monthly income

Difference in average monthly income of beneficiary households between baseline and AOS divided by baseline income and multiply by 100 quantifies the achievement of this indicator. Monthly income of beneficiary households was examined by different income sources employed by the households. Paddy cultivation is the main source of income for these households. In addition to the paddy, they cultivate other filed crops and perennial cash crops like coconut. Few of them engage with livestock (dairy farming). Total average (mean) monthly family income of the beneficiaries at baseline situation is LKR 29,446. The average monthly income of beneficiaries at AOS is LKR 35692.38. Accordingly, it revealed that the average household income has increased by 21.23%. The monthly income was derived from the average annual income of the households, which is presented in table 1.

Table 1: Average household income at AOS

	Average annual HH income at AOS (2022) - Rs
Mean	356952.38
Median	282625.00
Mode	170000.00
Standard Deviation	234609.30
Minimum	55000.00
Maximum	970000.00

5.1.6 % Of increasing average monthly income from traditional rice cultivation

The consultants measured this indicator in line with the definition that the income difference between Baseline and AOS from traditional rice cultivation is divided by baseline and multiplied by 100. Baseline value of the average monthly household income from traditional rice cultivation is not available in the baseline report. However, the consultants collected the baseline data at household level during the outcome survey using the memory recall method. The annual averages of household income from traditional rice cultivation before and after the project are presented in the table below. Based on the table values, % increase of average monthly income from traditional rice cultivation of the beneficiary households is estimated at 44.37%.

Table 2: average monthly income from traditional rice cultivation

	Baseline (2019) - Rs.	AOS (2022) - Rs.
Mean	100817.07	145554.17
Median	82500	110250.00
Mode	110000	51000.00
Standard Deviation	41719.3	100593.42
Minimum	27500	45000.00
Maximum	277000	374000.00

5.2 Outcome level indicators

5.2.1 % Increase in average yield of traditional rice (kg/ac)

This indicator was measured calculating difference in yield between Baseline and AOS divided by baseline yield and multiply by 100 as guidance given in the M & E matrix of this 4P project. Table 3 presents the results. As per to the table figures, mean yield / ac of traditional rice has decreased by 36.67% compared to the baseline situation, which was reported in the baseline report. Obviously, the baseline yield figures were mistakenly reported in the report, which seem to be kg per ha. Converting the yield figures as per actual unit of measurement (kg/ac), the consultants compared the average yield of traditional rice before and after the project intervention. During the FGDs, farmers expressed that the yield has been decreasing after the first year of the program. Reasons for the yield decrease were the result of having low quality seed paddy, shortage of inputs for producing compost, difficulties in producing organic pesticides & fertilizer, damages from animals and loosened interest of some farmers specially in Warawawa of the Giribawa DSD in the Kurunegala district due to unavailability of extension service by the project during the latter part of the project. However, the baseline averages are appeared to be too high. It was also revealed during the FGDs that the farmers obtained higher yields

in the early stage of the project, specially the first two seasons. Probably the baseline must have been conducted after commencement of the project.

The results found that the difference between the maximum yield and the mean yield is 983.33 kg. The maximum yield/ ac is 2000 kg while the mean yield / ac is 937 kg which is far below from the potential yield. It leaves much to be desired. Hence, there is much need for improvement of the traditional rice productivity. To achieve the optimal yield level, beneficiaries must be further capacitated with necessary technical and practical knowhow.

Table 3: % Increase in average yield

Season	Seasonal average yield - kg/ac	
Yala (2019) - Baseline	1744	1480
Maha (2019/2020) - Baseline	1216	
Yala (2022) - AOS	1020	937
Maha (2021/2022) - ASO	854	

5.2.2 % of HHs reporting an increase average yield (Kg/ha)

Number of sampled HHs reporting an increase in average yield by total sample HHs multiply by 100 gives an estimation for this indicator. Since there was no baseline database available, corresponding baseline data were collected through memory recall method during the outcome survey to identify the households whose traditional rice yield has been increased. In a situation where 42.8% of the respondents had not cultivated traditional rice during the reporting period (2022). Taking their difference of traditional rice yield to measure this indicator is not meaningful. Therefore, only 24 households (57.2%) of the total respondents who had cultivated traditional rice during this period were considered to the valid sample. Since there are 10 HHs reporting an increase, 11 HHs reporting yield decrease and 3 HHs reporting no difference, % of HHs reporting an increase in average yield is 41.66%.

5.2.3 % of increase in average production of rice farmer

Mean traditional rice production per household in 2019 and 2022 is respectively 1168.66 kgs and 1061.67 kgs. The difference in average production between Baseline and AOS is minus 106.9 kgs. The difference was divided by baseline production and multiply by 100 to get % of increase. Accordingly, average production of traditional rice per household has been decreased from the inception of the project to present situation by 9.15%. Table 4 depicts the details of the analysis.

Table 4: Average production of a traditional rice farmer

	Average production of a traditional rice farmer/ Season	
	Baseline (2019) - Kg	AOS (2022) – Kg
Mean	1168.66	1061.67
Median	950.00	825.00
Mode	700.00	800.00
Standard Deviation	613.89	576.16
Minimum	400.00	440.00
Maximum	2600.00	2400.00

5.2.4 % of HH reporting an increase in average production (70%)

The indicator was measured following the indicator reference guide presented in the M & E matrix of the traditional rice project (Number of sampled HHs reporting an increase in average production is divided by total sample HH and multiply by 100). As there was no baseline database is available to calculate this indicator, household level baseline data was collected through memory recall method during the outcome survey. Since, 42.8% of the respondents did not cultivate traditional rice during the reporting period (2022), their difference of traditional rice yield to measure this indicator is not considered. Only 24 households (57.2%) of the total respondents had cultivated traditional rice during this period. Accordingly, these 24 households were considered to the valid sample. Since there are 10 HHs reporting an increase, % of HHs reporting an increase average production is 41.66%.

5.2.5 % Increase in volume and value of sale

Difference between baseline and AOS divided by baseline value multiply by 100 is the formula to compute the measurement of this indicator. It was reported that average volume of sale has been decreased while average value of sale has been increased as table 5 indicated. However, it is impossible to quantify the indicator because two indicators are combined into one indicator. Technically this is not appropriate. Therefore, this indicator must be rewritten in to two indicators, splitting two results in to two indicators. In this situation, average volume of sale and average value of sale are reported separately. It reveals that average volume of sale has been decreased by 10% and average value of sale has been increased by 44.37% based on the corresponding values presented in table 5. Increase of value of sale is because of increase of farm gate price by 46.18.

Table 5: Volume and value of sale per season

	Average volume sold – 2022 (kg)	Average volume sold – 2019 (kg)	Value of sale – 2022 (LKR)	Value of sale – 2019 (LKR)	Average farm gate price (Rs.) - 2022	Average farm gate price (Rs.) - 2019
Mean	870.83	968.05	145554.17	100817.07	160.26	109.63
Median	700.00	800.00	110250.00	82500.00	160.00	110.00
Mode	300.00	1000.00	51000.00	110000.00	150.00	110.00
Std. Deviation	542.92	70.71	100593.42	6363.96	14.76	1.92
Minimum	300.00	250.00	45000.00	27500.00	135.00	100.00
Maximum	2000.00	2500.00	374000.00	277000.00	180.00	110.00

5.2.6 % of HH reporting an increase volume and value of sale

M & E matrix guides to measure this indicator by number of sampled HH reporting an increase divided by total sample HH multiply 100. Households those who cultivated traditional rice during the reporting period were considered to measure this indicator that is 24 HHs. Six HHs are reported to have an increase in both volume of sale and value of sale while others have the other combinations. Accordingly, 25% of HHs are reporting an increase volume and value of sale.

5.2.7 Number of farmers who involve in cultivation of traditional rice

Total number of HHs involving in traditional rice cultivation being promoted by Parabowa Organic Farmers Organization (POFO) is 516. These HHs were attached to the POFO before the project intervention. Among them 110 HHs were selected to the SAPP 4P project titled "Traditional rice production as an agri-business to uplift livelihood of smallholder farmers" located in Puttalam and Kurunegala District. One of the conditions / selection criteria was that a farmer must be attached to a bank to obtain the SAPP loan. However, some members those who were already had taken loans from the banks and black listed due to some reasons were not eligible to participate for the project activities though they were in need of receiving project assistance and said to be good farmers.

Mission of the POFO is to promote organic traditional rice among its members. There are 26 members those who have already obtained organic certification. Two batches are at level 2 and 3. The following table depicts the number of members and their organic status as at AOS.

Table 6: Number of members and their organic status as at AOS

Division	No. of members	No of farmers taken organic certificate
Kirimatiyana	26	24 (100% organic)
Warawawa (Giribawa)	63	57 (Level 3)
Moriyakulama (Puttalam)	21	21 (Level 2)
Others	406	0
Total	516	102

5.2.8 Average quantity of traditional seed paddy produced per year (2 seasons)

Farmers reported to have five traditional rice varieties currently grown in the area. They are Suwadel, Pachcha Perumal, Kaluheenati, Kuruluthuda and Batapola al. Study results indicate that the farmers obtain traditional seed from informal sources, majorly from their own saved seed. Other important sources of seed that they obtained from fellow farmers. This has already created implications on the quality of seed that farmers use for their farming businesses. It is important for them to purchase certified seed that is pure & labeled. Other companies which promote traditional rice provide seeds at Rs. 200 – 220. POFO provided quality seeds only in the first season of the program. Consequently, seed quality has been dropped considerably. Production of quality seeds is a specific process that needs much attention. This is an opportunity for young entrepreneurs to start an agribusiness that project / POFO can guide. Though, one of the objectives of this traditional rice project was to produce minimum of 2.5 MT high quality seed paddy of selected traditional rice varieties as youth entrepreneurship as separate entity, this objective has not been realized.

5.2.9 % of reduction of postharvest losses

As baseline data is not available, this indicator could not be measured.

5.2.10 % of HHs who practiced the parachute method for crop establishment

Since the project commenced, six seasons have been passed as of AOS. Parachute method was introduced during the first season, providing 310 trays per farmer that are needed for one acre to practice the parachute method. It was only this-time that majority of the farmers used this method. After that most of the farmers have loosened their interest as this method needs intensive land preparation and a high-water level to practice. Ploughing must be done three times with long intervals for weed control as these farmers do not use chemical weedicides. But present water distribution system makes it difficult to practice these methods. Therefore, mechanical weeding is important. Only around 5 % of farmers

practiced this method before the project. As at present situation, % of HHs who practiced the parachute method for crop establishment is same as before the project. It is only 5%. Other than this method SAPP must have introduced some cropping system like System of Rice Intensification (SRI) and motorized weeders so as to make parachute method more effective and popular.

5.2.11 % of farmers reporting that they receive a better service from the project

It is 54.8% of farmers reporting that they received a better service from the project.

Table 7: % of farmers reporting that they received a better service from the project

Response	No of HHs	Percent (%)
No	19	45.2
Yes	23	54.8
Total	42	100.0

5.2.12 % of farmers reporting that they received assured market through the project

Percentage of farmers reporting that they received an assured market through the project is 100% but they pointed out that it is for limited quantities and problematic. This is due to POFO buys preplanned volume of traditional paddy based on their existing market requirement. Their target is much smaller than the production of the members (table 8).

5.2.13 % of farmers who sold their paddy to Parabowa

The baseline study has found that out of 56 beneficiaries, 17 of them already sold their harvest to Parabowa Organic Farmers' Organization. At present, 100% (24) of respondents who cultivated traditional rice during 2022 sold their paddy production to Parabowa while some of them sold portion of their production to other buyers too. However, participants in Warawawa at the FGD stated that in the first season itself the organization failed to buy the paddy production which created a problematic situation for farmers. Due the issues occurred in selling their paddy, these farmers were reluctant to engage in cultivating indigenous varieties of paddy.

5.2.14 Quantity of traditional paddy purchased from HHs per year (2 seasons) by company

Parabowa had a limit of one acre of organic cultivation for a farmer and buy only 1200 kg of paddy (expecting a harvest of 1500 kg per acre and keeping apart 300 kg for consumption purpose of the household and the balance 1200 for selling). Some farmers had cultivated more than one acre, sometime more than 8 acres. But Parabowa inspected only one acre extent mainly. As the price of Parabowa is higher than the market price, everybody tried to sell their all the paddy production to Parabowa. As the certification has been or to be given only for a one acre, Parabowa was not in a position to buy the extra production of farmers. In this case, some farmers specially in Giribawa DSD tended to give up the traditional rice cultivation. The following table presents the quantity of traditional paddy purchased by the Parabowa export company in collaboration with POFO.

Table 8: Quantity of traditional paddy purchased from HHs per year (2 seasons) by company

Season	Quantity of traditional paddy purchased by the company (kg)
2022 Yala	110000
2021/2022 Maha	160000
2021 Yala	110000
2020/2021 Maha	160000
2020 Yala	80000
2019/2020 Maha	80000
2019 Yala	60000

5.3 Output level indicators

Measurements of the output indicators are presented in table 9.

Table 9: Measurement of output indicators

Output indicator	Measurement
% of farmers who received credit/grant for traditional rice cultivation by gender and type of grant materials and credit	100%
Number of farmers who received the grant/credit by gender and type of grant materials and credit	110 farmers
Number of farmers who received the quality traditional seed	4.90%
Number of youth /farmers who produced the traditional seed paddy	
Number of training programs held	3
% of farmers who participated in training programs	57.10%
% of farmers who reported that they benefitted from training	50%
% of farmers who followed the practices as per introduce by Project	50%
% of HH reporting that they received the service from POFO	64.10%

6. Project evaluation

A partnership has been built up among 110 farmers, Parabowa Organic Farmers' Organization (POFO) and Smallholder Agribusiness Partnership Program (SAPP). This has been in operation as a Private Public Producer Partnership arrangement and hence the total investment of the project is LKR 20.5 Mn where SAPP invested LKR 10.9 Mn. Out of the total, SAPP investment of LKR 3.3 Mn is a loan facility for producers through SAPP credit line at 6.5% interest. The balance is a grant. SAPP has invested on POFO as a grant of LKR 2.6 Mn and farmer contribution for investment is LKR 9.3 Mn. The project has been almost completed. During the outcome survey, the consultants evaluated the project achievements assessing its relevance, efficiency, effectiveness, impact and sustainability.

The direct beneficiaries during the household survey rated the above evaluation criteria with their views about aspects of the project intervention, using the scale of 1 – 5. (1. Highly Satisfactory, 2. Satisfactory, 3. Neutral, 4. Unsatisfactory, 5. Highly Unsatisfactory). They assessed the status of project benefits and interventions, production and productivity levels of the produce, comparing to their status before and after the project intervention that indicates mixed results as presented in table 10.

Table 10: Direct beneficiaries' views about aspects of the project intervention

Criterion	Highly Satisfactory	Satisfactory	Neutral	Unsatisfactory	Highly Unsatisfactory	Total
Relevance	2%	29%	44%	22%	2%	100%
Efficiency	0%	24%	56%	17%	2%	100%
Effectiveness	0%	20%	51%	27%	2%	100%
Impact	0%	15%	53%	30%	3%	100%
Sustainability	0%	10%	49%	32%	10%	100%
Overall satisfaction	0%	12%	59%	27%	2%	100%

6.1 Relevance of the project - Is the intervention doing the right things?

Though the project concept is relevant at some extent, project intervention providing with a bank loan of LKR 30000, 310 parachute trays, 2 carpets and some trainings for each selected farmer has not enhanced the capacity of beneficiary households, increased the employment opportunities and, reduced poverty of people as expected. These results question whether the project did the right things and the project has addressed the real needs of the beneficiaries. Among the respondents, twenty two percent (22%) of the respondents say that the project is relevant while 2% of them rate the project as highly relevant. Forty-four percent (44%) of them are torn between relevant and not relevant.

Meanwhile 22% and 2% of the respondents are respectively dissatisfied and highly dissatisfied over the project relevance.

Traditional rice production still has only a niche market which is limited to expand in Sri Lanka. Nevertheless, traditional rice with an organic certificate can be attracted by the export market. Therefore, SAPP should have promoted organic certified rice production among the beneficiaries in line with the capacity of the promoter who is struggling in maintaining the cash flow and working capital. The intervention logic based on the hypothesis that traditional rice production as an agri-business will uplift livelihood of smallholder farmers could have been more appropriate if the project intervened with new technologies other than parachute method e. g. power weeders, organic agriculture extension service, organic certification, promotion of labeled quality seed paddy production and organic fertilizers and pesticides etc. that would have created more agribusinesses among the youth in the project area.

6.2 Efficiency of the project's interventions - How well are resources being used?

The efficiency of the project was rated by assessing the factors such as cost efficiency, cost benefits ratio, mitigation of external constraints, and corrective measures to overcome delays. Procurement of Parachute trays, carpets and silos took a circular route to dispatch for beneficiaries that made a delay and confusion among beneficiaries. Moreover, this situation was aggravated due to country lock down and mobility restrictions during the pandemic situation of COVID 19 and the challenges created by recent economic crisis of the country such as price escalation and banning of imports. However, given the situation, the project has been able to complete the activities within the time frame. As per to the opinions of the beneficiaries, twenty-four percent (24%) of the respondents have stated that the project was efficient. Fifty six percent (56%) of the respondents rated the project efficiency as neutral (Neither satisfactory nor dissatisfactory). Seventeen percent (17%) of the respondents were dissatisfied and 2% of the respondents were highly dissatisfied over the project efficiency.

6.3 Effectiveness of the project's interventions - Is the intervention achieving its objectives?

Views of the respondents over the project effectiveness, which were collected during the outcome survey in the scale of 5 levels revealed that assessment of the project effectiveness gives mixed results showing a mixture of different opinions. The project effectiveness was rated by 0%, 20%, 51%, 27% and 2% of the respondents respectively. This project was viewed as effective by 20% of the respondents since it realized their goals appropriately through different activities and they obtain the benefits. The benefits to the

beneficiaries in terms of increased and effective farming operations and accessible market were highlighted by these beneficiaries. Findings of the focus group discussions conducted in some places revealed that most of the beneficiaries had faced challenges from lack of technology, poor access to market and improper agricultural practices. Thus, the overall results (outputs and outcomes) do not justify the costs incurred for improvement of agri-businesses to uplift livelihood of smallholder farmers in the project area. Though, appropriate means of verification for tracking progress, performance and achievement of indicator values have been defined, the quantity and quality of the outputs produced have not been much effective.

6.4 Impact of the project's interventions - What difference does the intervention make?

Mainly due to the country situation, impact could not be discernible. The ability of even the niche market to buy these traditional rice products has become less. Therefore, scalability is problematic. Nevertheless, improving the certified organic grower system can meet the scalability. The Project has achieved its overall project development objectives at some extent. The results show a positive impact of the project in some aspects of improvement to the beneficiaries assisted by the project. As well, it was evident that there is an increase in number of established traditional paddy growers. It further revealed that direct and indirect employment opportunities increased through Parabowa Export (Pvt) Limited for youth. However, there are some gaps to be filled in order to guide the beneficiaries to arrive at their maximum capacity in both technical and financial to uplift their farming to an agribusiness. It was noticed that the culture of maintaining farm and financial records is poor among the targeted beneficiaries which need further project attention. No one has rated the project impact as "highly satisfactory" while 15% of the beneficiaries have rated the project impact as "satisfactory". Fifty three percent (53%) of the beneficiaries are neutral in their opinion. Meanwhile 30% and 3% of the beneficiaries have rated the project impact as dissatisfactory and highly dissatisfactory.

6.5 Sustainability - Will the benefits last?

Parabowa Organic Farmers Organization (POFO) is a company driven farmer organization with a current membership of 516. Out of that 26 farmers have received organic certification for one acre paddy land. Seventy-four farmers are in the process of conversion. Other farmers are currently involved in producing just traditional rice. The company, Parabowa Export (Pvt) Ltd, targeting high end local market and for partially export market, buys the traditional paddy from the members of the POFO. The company has already started export business at small scale. To cater to the export market, company have to have a continuous organic paddy supply in large quantities. Thus, the business is at a cross road. Loosened interest of some farmers and poor internal compliance on controlled organic practices in the field have created some doubt over the sustainability.

According to the farmers, traditional paddy cultivation does not require fertilizer and pesticides and used traditional methods to eliminate pest attacks. However, they have issues on finding the best quality traditional paddy seeds at a reasonable price. Farmers who already engage with the promoter entity has given traditional paddy seeds for the farmers initially. Later, they have given training for farmers on producing seeds for their own use. But it has not worked. In the assessment, no beneficiary (0%) has rated the project sustainability as "highly satisfactory" and 10% of the beneficiaries have rated the project sustainability as "satisfactory". Forty-nine present (49%) of beneficiaries are neutral in their opinion while 32% and 10% of beneficiaries are respectively dissatisfied and highly dissatisfied over the sustainability of the project impact. In analysis of all the facts collected from different sources, the consultants conclude that the project is likely sustainable if SAPP takes extended efforts to strengthen the organization capacity of the POFO and its regional network through a capacity building program.

7. Conclusions & Recommendations

7.1. Conclusions

The project has fulfilled the requirements of 13 outcome indicators (out of 20). However, fulfilment of the beneficiaries' expectations and their satisfaction leaves much to be desired. Given the prevailing situation in the country during the project implementation period, the level of achievement of the expected outcomes is acceptable at some extent. As such, the project is rated as "Moderately Satisfactory".

6.2. Recommendations

- There is much need for improvement of the organic traditional rice productivity. To achieve the optimal yield level, beneficiaries must be further capacitated with necessary technical and practical knowhow through an intensive organic agriculture extension service.

- Production of quality seeds, organic fertilizers and pesticides is a specific process that needs much attention. This is an opportunity for young entrepreneurs to start an agribusiness that SAPP / POFO can guide.

- Other than the parachute method, SAPP must have introduced some cropping system like System of Rice Intensification (SRI) and motorized weeders so as to make parachute method more effective and popular

- The consultants recommend for SAPP to take extended efforts to further strengthen the organization capacity of the POFO and its regional network through a capacity building program.

Appendix 01: Project M & E matrix

RESULTS LEVEL	INDICATOR	DEFINITION - How is it calculated?	BASELINE - What is the current value?	TARGET - What is the target value? (5 years)
Goal	% of HH with improvement in assets ownership (asset index)	Number of samples HH with improvement in HHAI divided by sampled HH multiply by 100		70%
	Total number of HH receiving project service by gender	Total number of HH receiving project service by gender	-	100
	% of supported HH reporting an increase in monthly income by 20 -30 % by gender	Number of sampled HH reporting an increase in income divided by total sample HH multiply 100	-	70
	% of increasing average monthly income	Difference in average monthly income between Baseline and AOS divided by baseline income and multiply by 100	-	20-30
	% Of increasing average monthly income from traditional rice cultivation	Difference between Baseline and AOS by divided by yield baseline and multiply by 100		

RESULTS LEVEL	INDICATOR	DEFINITION - How is it calculated?	BASELINE - What is the current value?	TARGET - What is the target value? (5 years)
Outcome	% Increase in average yield of traditional rice (kg/ha)	Difference in yield between Baseline and AOS divided by baseline yield and multiply by 100	-	15
	% of HH reporting an increase average yield (Kg/ha)	Number of sampled HH reporting an increase in average yield by total sample HH multiply by 100	-	100
	% of increase in average production of rice of farmer.	Difference in average production between Baseline and AOS divided by baseline production and multiply by 100	-	70
	% of HH reporting an increase in average production (70%)	Number of sampled HH reporting an increase in production divided by total sample HH and multiply by 100	-	100
	% Increase in volume and value of sale	Difference between baseline and AOS divided by baseline value multiply by 100		40
	% of HH reporting an increase volume and value of sale	Number of sampled HH reporting an increase divided by total sample HH multiply 100	-	100

RESULTS LEVEL	INDICATOR	DEFINITION - How is it calculated?	BASELINE - What is the current value?	TARGET - What is the target value? (5 years)
Outcome	Number of farmers who involve in cultivation of traditional rice	Number of farmers who involve in cultivation of traditional rice	100	100
	Average quantity of traditional seed paddy produced per year (2 seasons)	Quantity produced divided by number of youths		
	% of reduction of postharvest losses	% of post-harvest losses at baseline minus % of postharvest losses at AOS		
	% of HH who practiced the parachute method for crop establishment	Number of sampled HH reporting practice of parachute method divided by total sample HH multiply 100	-	100
	% of farmers reporting that they receive better service from the project	No of farmers reporting better service divided by sample farmers multiply by 100	-	100
	% of farmers reporting that they received assured market through the project	No of farmers reporting assured market divided by sample farmers multiply by 100	-	100
	% of farmers who sold their paddy to Parabowa	No of farmers who sold their paddy to Parabowa divided by sample farmers multiply by 100	-	100
	Quantity of traditional paddy purchased from HH per year (2 seasons) by company	Quantity of paddy purchased by Parabowa	-	100

RESULTS LEVEL	INDICATOR	DEFINITION - How is it calculated?	BASELINE - What is the current value?	TARGET - What is the target value? (5 years)
Output	% of farmers who received credit/grant for traditional rice cultivation by gender and type of grant materials and credit	Number of farmers who obtained credit from project divided by total number of farmers multiply by 100	-	Total =100
	Number of farmers who received the grant/credit by gender and type of grant materials and credit	Count		
	Number of farmers who received the quality traditional seed	Count		
	Number of youth /farmers who produced the traditional seed paddy	Number of sampled farmers who produced traditional seed paddy by total sampled farmers multiply 100		
	Number of training programs held	Count	-	
	% Of farmers who participated in training programs	Number of sampled farmers who participated divided by total sampled farmers multiply 100		
	% of farmers who reported that they benefitted from training	Number of sampled farmers who reported that benefited divided by total sampled farmers multiply 100		
	% of farmers who followed the practices as per introduce by Project	Number of sampled farmers who reported that benefited divided by total sampled farmers multiply 100	-	100
	% of HH reporting that they received the service from cooperative society	Number of sampled farmers who reported that benefited divided by total sampled farmers multiply 100	-	100

Appendix 02: Household Questionnaire

Outcome Survey (2022) - Parabowa Paddy Cultivation Project (Smallholder Agribusiness Development Programme)

Introduction

- My name is _____ and I am involving in data collection on behalf of IPID for the outcome survey of greenhouse tomato Project which has been implemented by SAPP.
- Your household has been selected as a sample unit by chance from all beneficiaries that were supported by the project. The purpose of this interview is to obtain the project assisted information of your cultivation and its progress.
- The information provided by you for this survey will be confidential. The information will be used to prepare reports, but will not disclose for anybody. Hence, there will be no way to identify that you have given the information and we assure the privacy of the information provided.
- Therefore, could you please spare some time (around 40 minutes) for this interview?

Instructions to fill the questionnaire

- Please be responsible to fill this questionnaire simply and apparently. The data collection / tabulation will be done using a mobile application called KoBoToolBox.
- Please select possible answer/s of closed-ended questions and fill open-ended questions with clear & relevant answers.
- There are two types of questions included in the questionnaire. One is Single Answer (SA) questions and other type is Multiple Answer (MA) questions. Generally, MA questions have more than single answers. Therefore, please make sure to get all possible answers for MA questions. The type of the question has been mentioned within bracket at the end of question.

1 General Information

1.1 Name of the respondent	
1.2 Address (Optional)	
1.3 Contact Number of the respondent	
1.4 name of the village	
1.5 GN Division	
1.6 DS Division	
1.7 District	
1.8 Gender of the household head	
1.9 Age of the household head (in years)	
1.10 Number of family members (Male)	
1.11 Number of family members (Female)	
1.12 Number of disable family members (Male)	
1.13 Number of disable family members (Female)	

2. Cultivation of traditional rice

2.1 Land extent

Item	Before the project	After the project
2.1.1 When did you start traditional rice cultivation?		
2.1.2 Land extent (ac) under traditional rice cultivation		
2.1.3 Irrigated land extent (ac) under traditional rice cultivation		

2.2 Number of farmers who received the quality seed

2.2.1 What are the traditional varieties you use				
2.2.2 Do you use quality seed paddy taken from DoA?	Yes		No	

2.3 Productivity – traditional rice cultivation

2.3.1 What is average yield obtained from traditional paddy cultivation for last 2 seasons (kg /ac)	(2022)	
	(2019)	
2.3.2 What is the approximate size of the cultivated area? (ac)	(2022)	
	(2019)	
2.3.3 Average number of Kgs sold from traditional rice (paddy) for one year period	(2022)	
	(2019)	
2.3.4 Total production of traditional paddy for a one-year period (Kg)	(2022)	
	(2019)	
2.3.5 What happened to the yield in the last two seasons?	Increased	
	Decreased	
	Not Change	

2.3.6 What were the reasons according to you? (Multiple Choice) for the answer above (2.3.5)	**Yes**	**No**
1. Quality seeds		
2. Irrigation (Regular Watering/ better distribution of rain fall)		
3. Inputs for producing compost		
4. Labour		
5. Producing organic pesticides & compost		
6. Land tenure problems		
7. Damages from animals (Rats, cattle, etc.)		
8. Preventive measures and timely detection of pests and diseases		
9. Extension services		
10. Availability of credit facilities		
11. Availability of store facilities		
12. Hire cost of machinery		
13. Cultural practices done using better methods		
14. Direct linkage with the Promoter Entity		
15. Timely cultivation		
16. Other (Specify)		

2.4 Marketing of traditional rice

2.4.1 To whom do you sell your traditional paddy production? Parabowa / Other buyers

2.4.2 How much you sold to Parabowa? Kg……..

2.4.3 What was the price you obtained from Parabowa? (Rs./Kg)…….

2.4.4 What was the average price you obtained from other buyers/ (Rs./kg)…….

2.4.1 What is the average farm gate price obtained per 1 kg? Rs.	(2022)	
	(2019)	
2.4.2 Price of Lowest and Highest in the last 2 seasons (2022)	Lowest price	
	Highest price	
2.4.3 Price of Lowest and Highest in the last 2 seasons (2019)	Lowest price	
	Highest price	
2.4.4 What is the cost of traditional rice cultivation for one acre?	Rs.	
2.4.5 What is the cost of production to produce 1 Kg of traditional paddy?	Rs.	
2.4.6 What is the income you earned from the traditional rice cultivation per year (Rs.)	(2022)	
	(2019)	
2.4.7 What happened to the income in last two seasons compared to the previous seasons?	Increased	
	Decreased	
	Not Changed	

Reasons for your answer……..

2.5 Backward and Forward Linkages and Value Creation – Paddy

2.5.1. To whom you sell your product	**Yes**	**No**
1. Promoter Entity		
2. Own Consumption		
3. Cooperative Mills around this area		
4. Private Mills		
5. Hotel/Restaurant		
6. Mobile Traders		
7. Village Boutique Keepers		
8. Other (Specify)		
2.5.2. If yes to above, Indicates the sold quantity as a % of total production	**% of total production**	
1. Promoter Entity		
2. Own Consumption		
3. Cooperative Mills around this area		
4. Private Mills		
5. Hotel/Restaurant		
6. Mobile Traders		
7. Village Boutique Keepers		
8. Other (Specify)		
2.5.2. Are you engage in any value addition activities or making by products?	**Yes**	**No**
1. Not involve in Value addition		
2. Rice Bran Oil		
3. Products made by Rice Flour (String Hoppers, Hoppers, etc.)		
4. Traditional Festival Foods (Kavili, etc.)		
5. Rice Popcorn		
6. Liquor		
7. Rice Straw and Husk (Substitute for Fossil Fuel and used to produce Mushroom and used as		
8. Other (Please Specify)		

2.5.3. From whom do you purchase / obtain your material inputs needed for paddy Cultivation?	Seed Paddy	Fertilizer	Weedicides	Pesticides	Equipment	Other (Specify)
1. Facilitated by Own						
2. Agrarian Service Centers						
3. Private Input Dealers						
4. Promoter Entity						
5. Mobile Traders						
6. Private Millers						
7. Other (Specify)						

3. Farm Income – Other Crops

2.6.1. What are the other crops cultivated by you	(2022)	
	(2019)	
2.6.2. What is the income you earned from the other crops cultivated per year (Rs.)	(2022)	
	(2019)	
2.6.3. What happen to the yield of other crops in last two batches?	Increased	
	Decreased	
	Not Change	

1. Total Household income / year

Agriculture (crops)		Rs:	Remarks/calculation
Paddy			
Other seasonal crops			
i.			
ii.			
iii.			
Non-seasonal crops			
i.			
ii.			
iii.			
Livestock			
Buffalos	Milk		
	Value-added items 1 2 3		
	Animal		
Cattle	Milk		
	Value-added items 1 2 3		
	Animal		
Poultry			
Swine (Pigs)			
Goat	Milk		
	Animal		

Fisheries		
Other (specify…..)		
Agricultural labor		
Non agriculture		
Government employment		
Private sector employment		
Self-employment		
Other		
Pension payment		
Samurdhi		
Disability/Elderly payment		
Remittances		
Other cash receipts (specify……)		
Other gains (specify……..)		

What has happened to the income in comparing to the previous years?	Increased	
	Decreased	
	Not Change	

If the income was decreased, what was the reason according to you?		
If the income was Increased, what was the reason according to you?		

2. Household Index

If Yes / HH has or use, please enter "1", if no, please enter "0"

5.1. **Land o**wnership of the dwelling by Household Member (A)	
5.2. **House** Owned by Household Member (B)	
5.3 Foot Bicycle (C)	
5.4. Motor Bike (D)	
5.5. Three-wheeler (E)	
5.6 Two-Wheel Tractor (F)	
5.7 Four-Wheel Tractor (G)	
5.8 Truck/ Lorry (H)	
5.9 Car (I)	
5.10 Van (G)	
5.11 Type of Housing (Roofing) - Concrete, Asbestos, Roof Tile (K)	
5.12 Type of Housing (Floor) - Cement, Ceramic Tiles, Terrazzo (L)	
5.13 No. of divided Bedrooms – 2 or more (M)	
5.14 Principal Source of Drinking Water Supply - Piped Water Supply into Yard or Plot, tube well, Protected Well within premises (N)	
5.15 Principal Source of Cooking Fuel - Kerosene, LP Gas, Biogas, Coal/Lignite, Electricity (O)	
5.16 Quality of Drinking Water Supply - Drinkable as it is (P)	
5.17 Radio (Q)	
5.18 Television(R)	

6. Project support and services (tick or write the correct answer)

Support	Yes	No
6.1 Did you receive any project services	Yes	No
6.2 Do you sell your groundnut to the Promoter (REDF)	Yes	No
6.3 Did you receive an assured market through the REDF/project?	Yes	No
6.4 Did you receive the grant/materials from the project?	Yes	No
6.4.1 Type of materials: (Ex. Seed paddy)	1. 2. 3. 4.	
6.5 Did you receive any credits facilitated by the project?	Yes	No
6.5.1 Type of credits:	1. 2. 3. 4.	

6.6 Did you participate in training programs conducted by the project	Yes	No
6.6.1 Types of trainings:	1. 2. 3. 4.	
6.7 Were you benefitted from the trainings provided?	Yes	No
6.8 Do you follow the practices introduced by Project	Yes	No
6.8.1 Practices introduced:	1. 2. 3. 4.	
6.9 Did you receive a better service from the project?	Yes	No
6.10 Have you received any service from a cooperative society?	Yes	No
6.10.1 What are the services:	1. 2. 3. 4.	
6.11 When you obtained the GNP certificate (Tick)	Before project	After project
6.12 Do you receive new or improved service through organization (REDF)	Yes	No
6.13 Have you obtained the service of drying and processing facility of REDF	Yes	No
6.14 Are you satisfied with the outcome you received	Yes	No
6.15 Are you satisfied with the project intervention?	Yes	No

7. Beneficiary Opinion over project implementation

What are your views about following aspects of the project intervention? Please use the scale of 1 – 5. (1. Highly Satisfactory, 2. Satisfactory, 3. Neutral, 4. Unsatisfactory, 5. Highly Unsatisfactory)

Criterion / Sub criterion	Level of satisfaction
7.1. Relevance of the project - Is the intervention doing the right things?	
7.2. Efficiency of the project's interventions - How well are resources being used?	
7.3. Effectiveness of the project's interventions - Is the intervention achieving its objectives?	
7.4. Impact of the project's interventions - What difference does the intervention make?	
7.5. Sustainability - Will the benefits last?	
7.6. What is your overall satisfaction over the SAPP project?	

7.7. What are the lessons learnt from the project?

……
……
……
……

7.8. What are the gaps you have identified in the project implementation

……
……
……

7.9 What are the recommendations you suggest to fill the gaps and do differently in the future projects in the similar nature?

……
……
……

Thank you for your time!

Date of Interview		**Location (GPS point)**	
Name of interviewer		**Signature of interviewer**	
Data entry by		**Date of data entry**	
Cross checked by		**Date of cross check**	

Appendix 3: Focus Group Guidelines

Section 1: Relationship with Clients/Buyers

1. What are the main products that you sell?
2. Where and whom do you sell your product probes: exporters, intermediary, broker, shop/store, associations, etc.) To which type of buyer do you currently sell the most of your product and why?
3. What are your buyer's main requirements? How do you learn about your buyer's preferences?
4. Do you have a contract/agreement with your clients/buyers? What it specifies?
5. Do you receive any assistance from your clients/buyers?
6. What are the steps you usually take to ensure that you meet your client's specifications?
7. Is it difficult to meet your client's requirements? Why?
8. Do your clients/buyers monitor your activities frequently?
9. Do you share knowledge with other producers? If so, what kind what do you share and why?

Section 2: Standards

1. Do you grade products according to quality? If yes, what are these grades?
2. What specific problems did you experience in complying with these standards?

Section 3: Environmental Sustainability & Social Aspects

1. Have you noticed any changes in the natural resources as a result of production?

Section 4: Business Environment & Supporting Services

1. Are there any government policies/laws/regulations that are helpful to your business?
2. Are there any of those that you would like to see changed? What changes would be helpful?
3. What kind of support/service do you receive for your cultivation? Who provides them? Are these services useful? Are you member of any business association/producer group farmer organization?
4. What are the benefits of being in the association?
5. What are the common problems that you face? Are you satisfied with the services that you receive?

Section 5: Opportunities and Constraints

1. What are the opportunities that the producers have in this area?
2. What strengths that you see the producers have in your area?
3. What are the most serious challenges facing you/industry?

Section 6: Project Intervention

1. What SAPP is doing in your area?
2. Have you received any initial training from SAPP?
3. Have you received financial assistance from SAPP? If yes, what is it?
4. What would you like to propose for SAPP to do for the farmers?
5. What have you learnt from any other similar projects in your area?
6. What are your recommendations to the project for implementing similar projects in future?
7. Any other comments/ remarks/ observations

Section 8: Assessment of the project -Relevance of the project - Is the intervention doing the right things?

1. Was the action adequately designed to respond to the needs of the direct beneficiaries?
2. Are the beneficiaries satisfied with the support they are receiving from project and do they understand SAPP's role in supporting the smallholders?

Section 9: Coherence of the project - How well does the intervention fit?

1. Were there synergies and interlinkages between this 4P project and other projects carried out by SAPP in the same thematic sector?
2. Was the project managed in a cost-efficient manner (in terms of human, financial and other resources versus the results)?

Section 10: Efficiency of the project's interventions - How well are resources being used?

1. What were the external constraints to achieving and scaling-up the project objectives and how well are they mitigated?
2. If there were delays, how important were they, what were the reasons for these delays, what were the consequences, and to what extent have appropriate corrective measures been implemented?

Section 11. Effectiveness of the project's interventions - Is the intervention achieving its objectives?

1. Were the expected results realized?

Section 12: Impact of the project's interventions - What difference does the intervention make?

1. What evidence is there that the project contributed to the achievement of its overall objective?
2. What were the unintended impacts of the project intervention, both positive and negative? Was the project able to monitor, mitigate and respond to any unintended negative effects?
3. Is the project able to contribute to the identification and formulation of future SAPP / IFAD programs in a meaningful way and what could be improved?

Section 13: Sustainability - Will the benefits last?

1. What evidence is there to suggest the project's interventions and/or results will be sustained after the project end?
2. What are the possibilities for replication and extension of the project's outcomes?
3. Have the necessary measures been taken to build on local capacities to address the sustainability, to enhance the role of women and to involve the private sector and public sector?
4. Has the SAPP provided any inputs and technologies to improve the value-chain and sustain the sector?

Appendix 04: Key Informants Guidelines

Guideline for Exporter/Promoter Entity

Section1: Business & the Products

1. Number of employees/members?
2. How long have you been in the business?
3. What are your main functions and activities performing?
4. What do you sell, and types of products do you sell? (Bulk/raw, value added, etc.)
5. Are you involved in any other business activities?
6. What are your main costs factors (e.g. shipment, customs, labour, raw materials etc.)?
7. What is the potential for value addition in your industry?
8. What are the most serious challenges for your organization?

Section 2: Clients/Buyers

1. What are your main markets (local/international)?
2. Who are your main clients their main requirements?
3. How do you learn about your client's preferences (order quantities, standards, quality requirements)?
4. Does your firm receive any assistance from your clients? (Advances, credit, information, inputs, technical assistance)
5. What are the steps you usually take to ensure that you meet your clients' specifications?
6. Is it difficult to comply with your clients' requirements?
7. Do you share information with other exporters?

Section 3: Producers

1. Who are your main suppliers?
2. Do you buy your product from individual producers, groups of producers or intermediaries?
3. How many producers do you work with?
4. Out of those producers, how many of them engaged with SAPP project?
5. How would you characterize the differences between those who engaged with SAPP and those who not involved?
6. How do you communicate information to your suppliers/producers regarding your requirements in terms of quality of, quantity, chemical use, delivery dates, etc.?
7. Have you provided training/awareness programme to your producers? If yes, how frequently?
8. What difficulties do your suppliers/producers have in meeting your demands?
9. How do you support them?
10. What changes would you like your suppliers/producers to make?
11. Do you think available suppliers/producers are capable enough for satisfying current demand?

Section 4: Standards

1. Do you grade products according to quality? If yes, what are these grades?
2. What are the existing international/national standards and regulations affecting your business?
3. What specific problems did you experience in complying with them?

Section 5: Environmental Sustainability & Social Aspects

1. Have you noticed any changes in the natural resources as a result of production? (Damages to bio-diversity, soil erosion, landslides, etc.)
2. Do you see any social issues that affects the performance of the value chain?

Section 6: Competition, Business Environment & Supporting Services

1. Who are your main competitors on the world market?
2. What strategies that you employ to make your product different from that of competitors?
3. What is the local competitive advantage of products from Sri Lanka?
4. Are there any government policies that are helpful to your business?
5. Are there any policies that you would like to see changed?
6. What is the infrastructure that you need to enhance your business?
7. What is the involvement with the SAPP project?
8. In future, what are your suggestion to the SAPP involvement

Guideline for key beneficiaries

Section 1: Introduction

1. Family Background and Self Review

Section 2: Agriculture Activities

1. How long have you been in the industry? Have you ever received any training in this industry?
2. If yes, from where are you obtain?
3. What is your recommendation for the training in future?
4. Do you own land? If yes, how much of land do you own?
5. What crops do you cultivate? How much do you produce (kg/year)?
6. How much do you spend for cultivation?
7. What are the inputs used?
8. If you have to buy the inputs, how much do you pay?
9. Do you hire people?
10. How much do you pay for a worker (daily or per quantity)?
11. Are you involved in any income generation activities other than cultivation?
12. Is cultivation the main source of income?
13. How much do you earn monthly?
14. Have you obtained loan? How much you obtain? From where are you obtain? What is the monthly installment?
15. Can you cope with this monthly installment?

Section 3: Standards

1. What are your buyer's main requirements/standards?
2. Is it difficult to meet your buyers' requirements/standards? Why?

Section 4: Assistance

1. Do you receive any assistance from your buyers?
2. What sort of assistance do your buyers provide?
3. you gain any assistance to comply with standards?
4. Who provides the assistance regarding standards?
5. Is the assistance helpful? Do you expect more?
6. If a private company supports these farmers, how would a company support them?
7. How could public sector support the farmers?

Section 5: Forward Backward Linkage and Value Addition

1. To whom do you sell your products? 1) Exporters 2) Collectors 3) Shop/ boutique 4) Company 5) Others

2. Inputs are supplied by, 1) Government 2) Exporters 3) Collectors 4) Shop/ boutique 5) Company 6) Others
3. Have you engaged in any value addition activities for your product?
4. If yes, what sort of value addition? If not, who is involve in it?
5. Have you ever trained to do the value addition? If you are trained, from where you obtain the training?

Section 6: Opportunities and Constraints

1. What are the opportunities that the producers have in this area?
2. What strengths that you see the producers have in your area?
3. Any outside threat /risk producers face?
4. What weaknesses that you can see these producers face in your area?

Section 6: Project Intervention

1. What SAPP is doing in your area?
2. Have you received any initial training from SAPP?
3. Have you received financial assistance from SAPP? If yes, what is it?
4. What would you like to propose for SAPP to do for the farmers?
5. What have you learnt from any other similar projects in your area?
6. What are your recommendations to the project for implementing similar projects in future?

Any other comments/ remarks/ observations

Guideline for project staff

Section 8: Assessment of the project - Relevance of the project - Is the intervention doing the right things?

1. Was the action adequately designed to respond to the needs of the direct beneficiaries?
2. Are the beneficiaries satisfied with the support they are receiving from project and do they understand SAPP's role in supporting the smallholders?

Section 9: Coherence of the project - How well does the intervention fit?

1. Were there synergies and interlinkages between this 4P project and other projects carried out by SAPP in the same thematic sector?
2. Was the project managed in a cost-efficient manner (in terms of human, financial and other resources versus the results)?

Section 10: Efficiency of the project's interventions - How well are resources being used?

1. What were the external constraints to achieving and scaling-up the project objectives and how well are they mitigated?
2. If there were delays, how important were they, what were the reasons for these delays, what were the consequences, and to what extent have appropriate corrective measures been implemented?

Section 11. Effectiveness of the project's interventions - Is the intervention achieving its objectives?

1. Were the expected results realized?

Section 12: Impact of the project's interventions - What difference does the intervention make?

1. What evidence is there that the project contributed to the achievement of its overall objective?

2. What were the unintended impacts of the project intervention, both positive and negative? Was the project able to monitor, mitigate and respond to any unintended negative effects?
3. Is the project able to contribute to the identification and formulation of future SAPP / IFAD programs in a meaningful way and what could be improved?

Section 13: Sustainability - Will the benefits last?

1. What evidence is there to suggest the project's interventions and/or results will be sustained after the project end?
2. What are the possibilities for replication and extension of the project's outcomes?
3. Have the necessary measures been taken to build on local capacities to address the sustainability, to enhance the role of women and to involve the private sector and public sector?
4. Has the SAPP provided any inputs and technologies to improve the value-chain and sustain the sector?

Appendix 05: Respondent list (Study Sample)

Beneficiary Group

#	Farmer Name	Address of the Farmer	Contact Number	NIC Number/passport number	Gender	District	Divisional Secretariat Division
1	W.T.M Kusumawathi,	Perakumpura	714255826	707764295V	Female	Puttlam	Giribawa
2	D.M.P Kumarihami,	Perakumpura		667662818V	Female	Puttlam	Giribawa
3	W.T.M. Dissanayaka,	Perakumpura	716025098	640402342V	Male	Puttlam	Giribawa
4	W.M.K.B Wanninayaka,	Perakumpura		753340696V	Male	Puttlam	Giribawa
5	J.W.T.Nilmini,	Perakumpura	715987751	877544387V	Female	Puttlam	Giribawa
6	A.M.D.N Alahakoon,	Perakumpura		857331869V	Male	Puttlam	Giribawa
7	R.H.M.M.C. Herath,	Perakumpura	7177230305	845113645V	Female	Puttlam	Giribawa
8	W.M.S.K Wasala,	Perakumpura		656424206V	Female	Puttlam	Giribawa
9	R.M.C.T. Bandara,	Perakumpura	714141887	848400904V	Male	Puttlam	Giribawa
10	W.M Senawirathna,	Perakumpura		197133004506	Male	Puttlam	Giribawa
11	W.T.M.M Wanninayaka,	Perakumpura	71181764	631822933V	Male	Puttlam	Giribawa
12	W.T.M.D.K Wanninayaka	Perakumpura		926323865V	Male	Puttlam	Giribawa
13	H.M.M.M Herath,	Perakumpura	711556337	797665614V	Female	Puttlam	Giribawa
14	W.M.S.K Wanninayaka,	Perakumpura		197462102925	Female	Puttlam	Giribawa
15	W.M Gunarathna,	Perakumpura	729011791	652983766V	Male	Puttlam	Giribawa
16	W.M.R Wanninayaka,	Perakumpura	712239716	866750093V	Male	Puttlam	Giribawa
17	P.A.D.S Wicramarathne,	Perakumpura		197513003017	Male	Puttlam	Giribawa
18	W.M Kalyanawathi,	Perakumpura	713818688	597362641V	Female	Puttlam	Giribawa
19	D.M.T.W Dasanayaka	Perakumpura		822042538V	Male	Puttlam	Giribawa
20	R.H.M.C Wanninayaka,	Perakumpura		198009700393	Male	Puttlam	Giribawa

#	Farmer Name	Address of the Farmer	Contact Number	NIC Number/passport number	Gender	District	Divisional Secretariat Division
21	A.H.M.D.B Karunawathi	Perakumpura		677131322V	Female	Puttlam	Giribawa
22	W.M.T.D Herath,	Perakumpura		735790340V	Male	Puttlam	Giribawa
23	W.T.M.K.C Wanninayaka,	Perakumpura	717384045	953323125V	Male	Puttlam	Giribawa
24	D.M.J.S Kumari	Perakumpura	713624317	696931348V	Female	Puttlam	Giribawa
25	W.T.M Tikiri Banda,	Perakumpura	723800114	512690131V	Male	Puttlam	Giribawa
26	D.M.T.M. Dasanayaka,	Perakumpura		200205303299	Female	Puttlam	Giribawa
27	R.S.C.B Jayalath	Perakumpura		740850717V	Male	Puttlam	Giribawa
28	P.M Aberathne	Perakumpura	711778342	196707903753	Male	Puttlam	Giribawa
29	R.M.A Ranasinghea	Perakumpura		760104914V	Male	Puttlam	Giribawa
30	R.P.K Jayalath	Perakumpura		197176001459	Male	Puttlam	Giribawa
31	D.M.B Dissanayaka	Perakumpura		741313936V	Male	Puttlam	Giribawa
32	B.A Jayawardhana	Perakumpura	767068547	691421309V	Male	Puttlam	Giribawa
33	J.R.C Jayalath	Perakumpura		772352409V	Male	Puttlam	Giribawa
34	P.M.H Gunarathna	Perakumpura	774557957	763405192V	Male	Puttlam	Giribawa
35	W.A.M Wicramasinghe	Perakumpura		196714303084	Male	Puttlam	Giribawa
36	P.M.I Kusumalatha,	Perakumpura		696423105V	Female	Puttlam	Karuwalagas wawa
37	A.A.Ranjith udaya kumara	Puttalam	723523662	822741452V	Male	Puttlam	Karuwalagas wawa
38	H.P.D.Kumara Dissanayaka	Puttalam		741704250V	Male	Puttlam	Karuwalagas wawa
39	M.Shiromy Priyangika Madawala	Puttalam	705060177	837490405V	Female	Puttlam	Karuwalagas wawa
40	R.A.C.K.Kulasinghe	Puttalam		611964357V	Male	Puttlam	Karuwalagas wawa
41	K.J.Q.Fernando	Puttalam		687052836V	Male	Puttlam	Karuwalagas wawa
42	J.K.J.Pradeep Kumara	Puttalam	726101438	863590191V	Male	Puttlam	Karuwalagas wawa
43	k.j.a.Shantha	Puttalam	723191920	823404387V	Male	Puttlam	Karuwalagas wawa
44	H.M.S.Saman Kumari	Puttalam	723367335	746604696V	Female	Puttlam	Karuwalagas wawa
45	D.A.Rathnayaka	Puttalam	722847363	660712550V	Male	Puttlam	Karuwalagas wawa
46	R.M.Wasantha Kumara	Puttalam		762144158V	Male	Puttlam	Karuwalagas wawa
47	H.P.D.Suranga Priyadharshana	Puttalam	779979452	199328104374	Male	Puttlam	Karuwalagas wawa

#	Farmer Name	Address of the Farmer	Contact Number	NIC Number/passport number	Gender	District	Divisional Secretariat Division
48	L.A.J.Premakumara	Puttalam	716970707	943654042V	Male	Puttlam	Karuwalagas wawa
49	A.A.Podinilame	Puttalam	760251338	732172181V	Male	Puttlam	Dankotuwa
50	M.A.Rasika Pemasiri	Kirimetiyana	774976079	750320627V	Male	Puttlam	Dankotuwa
51	M.A.Lal Nandakumara	Kirimetiyana	776012243	703200796V	Male	Puttlam	Dankotuwa
52	W.A.Rangika Suranthi	Kirimetiyana	312257646	797010707V	Female	Puttlam	Dankotuwa
53	T.M.Harith Lahiru	Kirimetiyana	778057383	911120151V	Male	Puttlam	Dankotuwa
54	H.A.Yamuna Kumari	Kirimetiyana	776623266	778450291V	Female	Puttlam	Dankotuwa
55	H.M.Premarathna	Kirimetiyana	773187632	196333100033	Male	Puttlam	Dankotuwa
56	N.P.Sarath Chandrawansha	Kirimetiyana	312250303	673560075V	Male	Puttlam	Dankotuwa

Appendix 06: Data analysis for calculating HHAI

FREQUENCIES VARIABLES=@5.1.LandownershipofthedwellingbyHouseholdMemberA
@5.2.HouseOwnedbyHouseholdMemberB @5.3FootBicycleC @5.4.MotorBikeD @5.5.ThreewheelerE
@5.6TwoWheelTractorF @5.7FourWheelTractorG @5.8TruckLorryH @5.9CarI @5.10VanG
@5.11TypeofHousingRoofingConcreteAsbestosRoofTileK
@5.12TypeofHousingFloorCementCeramicTilesTerrazzoL @5.13No.ofdividedBedrooms–2ormoreM
@5.14PrincipalSourceofDrinkingWaterSupplyPipedWaterSupplyintoYar
@5.15PrincipalSourceofCookingFuelKeroseneLPGasBiogasCoalLigniteE
@5.16QualityofDrinkingWaterSupplyDrinkableasitisP @5.17RadioQ @5.18TelevisionR
/BARCHART FREQ
/ORDER=ANALYSIS.
Frequencies

Notes		
Output Created		21-DEC-2022 00:13:38
Comments		
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	Cases Used	Statistics are based on all cases with valid data.
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Statistics																		
		5.1. Land ownership of the dwelling by Household Member (A)	5.2. House Owned by Household Member (B)	5.3 Foot Bicycle (C)	5.4. Motor Bike (D)	5.5. Three-wheeler (E)	5.6 Two-Wheel Tractor (F)	5.7 Four-Wheel Tractor (G)	5.8 Truck/ Lorry (H)	5.9 Car (I)	5.10 Van (G)	5.11 Type of Housing (Roofing) - Concrete, Asbestos, Roof Tile (K)	5.12 Type of Housing (Floor) - Cement, Ceramic Tiles, Terrazzo (L)	5.13 No. of divided Bedrooms – 2 or more (M)	5.14 Principal Source of Drinking Water Supply - Piped Water Supply into Yard or Plot, tube well, Protected Well within premises (N)	5.15 Principal Source of Cooking Fuel - Kerosene, LP Gas, Biogas, Coal/Lignite, Electricity (O)	5.16 Quality of Drinking Water Supply - Drinkable as it is (P)	5.17 Radio (Q)	5.18 Television(R)
N	Valid	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Frequency Tables

5.1. Land ownership of the dwelling by Household Member (A)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	3	7.1	7.1	7.1
	Yes	39	92.9	92.9	100.0
	Total	42	100.0	100.0	

5.2. House Owned by Household Member (B)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	2	4.8	4.8	4.8
	Yes	40	95.2	95.2	100.0
	Total	42	100.0	100.0	

5.3 Foot Bicycle (C)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	7	16.7	16.7	16.7
	Yes	35	83.3	83.3	100.0
	Total	42	100.0	100.0	

5.4. Motor Bike (D)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	3	7.1	7.1	7.1
	Yes	39	92.9	92.9	100.0
	Total	42	100.0	100.0	

5.5. Three-wheeler (E)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	34	81.0	81.0	81.0
	Yes	8	19.0	19.0	100.0
	Total	42	100.0	100.0	

5.6 Two-Wheel Tractor (F)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	25	59.5	59.5	59.5
	Yes	17	40.5	40.5	100.0
	Total	42	100.0	100.0	

5.7 Four-Wheel Tractor (G)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	35	83.3	83.3	83.3
	Yes	7	16.7	16.7	100.0
	Total	42	100.0	100.0	

5.8 Truck/ Lorry (H)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	40	95.2	95.2	95.2
	Yes	2	4.8	4.8	100.0
	Total	42	100.0	100.0	

5.9 Car (I)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	39	92.9	92.9	92.9
	Yes	3	7.1	7.1	100.0
	Total	42	100.0	100.0	

5.10 Van (G)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	41	97.6	97.6	97.6
	Yes	1	2.4	2.4	100.0
	Total	42	100.0	100.0	

5.11 Type of Housing (Roofing) - Concrete, Asbestos, Roof Tile (K)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	2	4.8	4.8	4.8
	Yes	40	95.2	95.2	100.0
	Total	42	100.0	100.0	

5.12 Type of Housing (Floor) - Cement, Ceramic Tiles, Terrazzo (L)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	1	2.4	2.4	2.4
	Yes	41	97.6	97.6	100.0
	Total	42	100.0	100.0	

5.13 No. of divided Bedrooms – 2 or more (M)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	3	7.1	7.1	7.1
	Yes	39	92.9	92.9	100.0
	Total	42	100.0	100.0	

5.14 Principal Source of Drinking Water Supply - Piped Water Supply into Yard or Plot, tube well, Protected Well within premises (N)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	1	2.4	2.4	2.4
	Yes	41	97.6	97.6	100.0
	Total	42	100.0	100.0	

5.15 Principal Source of Cooking Fuel - Kerosene, LP Gas, Biogas, Coal/Lignite, Electricity (O)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	38	90.5	90.5	90.5
	Yes	4	9.5	9.5	100.0
	Total	42	100.0	100.0	

5.16 Quality of Drinking Water Supply - Drinkable as it is (P)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	7	16.7	16.7	16.7
	Yes	35	83.3	83.3	100.0
	Total	42	100.0	100.0	

5.17 Radio (Q)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	18	42.9	42.9	42.9
	Yes	24	57.1	57.1	100.0
	Total	42	100.0	100.0	

5.18 Television(R)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	3	7.1	7.1	7.1
	Yes	39	92.9	92.9	100.0
	Total	42	100.0	100.0	

```
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    @5.3FootBicycleC @5.4.MotorBikeD @5.5.ThreewheelerE @5.6TwoWheelTractorF @5.7FourWheelTractorG
    @5.8TruckLorryH @5.9CarI @5.10VanG @5.11TypeofHousingRoofingConcreteAsbestosRoofTileK
    @5.12TypeofHousingFloorCementCeramicTilesTerrazzoL @5.13No.ofdividedBedrooms–2ormoreM
    @5.14PrincipalSourceofDrinkingWaterSupplyPipedWaterSupplyintoYar
    @5.15PrincipalSourceofCookingFuelKeroseneLPGasBiogasCoalLigniteE
    @5.16QualityofDrinkingWaterSupplyDrinkableasitisP @5.17RadioQ @5.18TelevisionR
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Correlations

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Syntax		CORRELATIONS
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		@5.3FootBicycleC @5.4.MotorBikeD @5.5.ThreewheelerE @5.6TwoWheelTractorF @5.7FourWheelTractorG
		@5.8TruckLorryH @5.9CarI @5.10VanG @5.11TypeofHousingRoofingConcreteAsbestosRoofTileK
		@5.12TypeofHousingFloorCementCeramicTilesTerrazzoL @5.13No.ofdividedBedrooms–2ormoreM
		@5.14PrincipalSourceofDrinkingWaterSupplyPipedWaterSupplyintoYar
		@5.15PrincipalSourceofCookingFuelKeroseneLPGasBiogasCoalLigniteE
		@5.16QualityofDrinkingWaterSupplyDrinkableasitisP @5.17RadioQ @5.18TelevisionR
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		/STATISTICS DESCRIPTIVES
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Descriptive Statistics			
	Mean	Std. Deviation	N
5.1. Land ownership of the dwelling by Household Member (A)	.9286	.26066	42
5.2. House Owned by Household Member (B)	.9524	.21554	42
5.3 Foot Bicycle (C)	.8333	.37720	42
5.4. Motor Bike (D)	.9286	.26066	42
5.5. Three-wheeler (E)	.1905	.39744	42
5.6 Two-Wheel Tractor (F)	.4048	.49680	42
5.7 Four-Wheel Tractor (G)	.1667	.37720	42
5.8 Truck/ Lorry (H)	.0476	.21554	42
5.9 Car (I)	.0714	.26066	42
5.10 Van (G)	.0238	.15430	42
5.11 Type of Housing (Roofing) - Concrete, Asbestos, Roof Tile (K)	.9524	.21554	42
5.12 Type of Housing (Floor) - Cement, Ceramic Tiles, Terrazzo (L)	.9762	.15430	42
5.13 No. of divided Bedrooms – 2 or more (M)	.9286	.26066	42
5.14 Principal Source of Drinking Water Supply - Piped Water Supply into Yard or Plot, tube well, Protected Well within premises (N)	.9762	.15430	42
5.15 Principal Source of Cooking Fuel - Kerosene, LP Gas, Biogas, Coal/Lignite, Electricity (O)	.0952	.29710	42
5.16 Quality of Drinking Water Supply - Drinkable as it is (P)	.8333	.37720	42
5.17 Radio (Q)	.5714	.50087	42
5.18 Television(R)	.9286	.26066	42

		5.1. Land ownership of the dwelling by Household Member	5.2. House Owned by Household Member (B)	5.3 Foot Bicycle (C)	5.4. Motor Bike (D)	5.5. Three-wheeler (E)	5.6 Two-Wheel Tractor (F)	5.7 Four-Wheel Tractor (G)	5.8 Truck/ Lorry (H)	5.9 Car (I)	5.10 Van (G)	5.11 Type of Housing (Roofing) - Concrete, Asbestos, Roof Tile (K)	5.12 Type of Housing (Floor) - Cement, Ceramic Tiles, Terrazzo (L)	5.13 No. of divided Bedrooms – 2 or more (M)	5.14 Principal Source of Drinking Water Supply - Piped Water Supply into Yard or Plot, tube well	5.15 Principal Source of Cooking Fuel - Kerosene, LP Gas, Biogas,	5.16 Quality of Drinking Water Supply - Drinkable as it is (P)	5.17 Radio (Q)	5.18 Television(R)
5.1. Land ownership of the dwelling by Household Member (A)	Pearson Correlation	1	.806**	-.124	.282	.135	.229	.124	.062	.077	.043	-.062	-.043	-.077	-.043	.090	.124	.133	.282
	Sig. (2-tailed)		.000	.434	.070	.396	.145	.434	.696	.628	.785	.696	.785	.628	.785	.571	.434	.400	.070
	N	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
5.2. House Owned by Household Member (B)	Pearson Correlation	.806**	1	-.100	.372*	.108	.184	.100	.050	.062	.035	-.050	-.035	-.062	-.035	.073	.200	.258	.372*
	Sig. (2-tailed)	.000		.529	.015	.494	.242	.529	.753	.696	.826	.753	.826	.696	.826	.648	.204	.099	.015
	N	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
5.3 Foot Bicycle (C)	Pearson Correlation	-.124	-.100	1	-.124	-.108	-.022	.029	-.200	-.124	.070	-.100	-.070	.124	-.070	-.290	-.200	-.129	.124
	Sig. (2-tailed)	.434	.529		.434	.494	.892	.857	.204	.434	.660	.529	.660	.434	.660	.062	.204	.415	.434
	N	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
5.4. Motor Bike (D)	Pearson Correlation	.282	.372*	-.124	1	-.101	.040	.124	.062	-.282	.043	-.062	-.043	-.077	-.043	-.225	-.124	-.053	.282
	Sig. (2-tailed)	.070	.015	.434		.525	.800	.434	.696	.070	.785	.696	.785	.628	.785	.152	.434	.737	.070

	N	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
5.5. Three-wheeler (E)	Pearson Correlation	.135	.108	-.108	-.101	1	.341*	.434**	.461**	.101	-.076	-.176	.076	-.101	.076	.049	-.434**	.175	.135
	Sig. (2-tailed)	.396	.494	.494	.525		.027	.004	.002	.525	.633	.264	.633	.525	.633	.757	.004	.268	.396
	N	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
5.6 Two-Wheel Tractor (F)	Pearson Correlation	.229	.184	-.022	.040	.341*	1	.412**	.271	.336*	-.129	-.043	.129	.040	.129	.228	-.412**	.028	.040
	Sig. (2-tailed)	.145	.242	.892	.800	.027		.007	.082	.029	.416	.785	.416	.800	.416	.146	.007	.860	.800
	N	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
5.7 Four-Wheel Tractor (G)	Pearson Correlation	.124	.100	.029	.124	.434**	.412**	1	.200	.124	-.070	-.200	.070	.124	.070	.073	-.314*	.258	.124
	Sig. (2-tailed)	.434	.529	.857	.434	.004	.007		.204	.434	.660	.204	.660	.434	.660	.648	.043	.099	.434
	N	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
5.8 Truck/ Lorry (H)	Pearson Correlation	.062	.050	-.200	.062	.461**	.271	.200	1	.372*	-.035	-.475**	.035	.062	.035	.308*	-.200	.194	.062
	Sig. (2-tailed)	.696	.753	.204	.696	.002	.082	.204		.015	.826	.001	.826	.696	.826	.047	.204	.219	.696
	N	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
5.9 Car (I)	Pearson Correlation	.077	.062	-.124	-.282	.101	.336*	.124	.372*	1	-.043	.062	.043	.077	.043	.540**	.124	.240	.077
	Sig. (2-tailed)	.628	.696	.434	.070	.525	.029	.434	.015		.785	.696	.785	.628	.785	.000	.434	.125	.628
	N	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
5.10 Van (G)	Pearson Correlation	.043	.035	.070	.043	-.076	-.129	-.070	-.035	-.043	1	-.698**	-1.000**	-.563**	-1.000**	-.051	.070	-.180	.043
	Sig. (2-	.785	.826	.66	.785	.633	.416	.660	.826	.785		.000	0.000	.000	0.000	.750	.660	.253	.785

	tailed)			0															
	N	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
5.11 Type of Housing (Roofing) - Concrete, Asbestos, Roof Tile (K)	Pearson Correlation	-.062	-.050	-.100	-.062	-.176	-.043	-.200	-.475**	.062	-.698**	1	.698**	.372*	.698**	.073	.200	.032	-.062
	Sig. (2-tailed)	.696	.753	.529	.696	.264	.785	.204	.001	.696	.000		.000	.015	.000	.648	.204	.839	.696
	N	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
5.12 Type of Housing (Floor) - Cement, Ceramic Tiles, Terrazzo (L)	Pearson Correlation	-.043	-.035	-.070	-.043	.076	.129	.070	.035	.043	-1.000**	.698**	1	.563**	1.000**	.051	-.070	.180	-.043
	Sig. (2-tailed)	.785	.826	.660	.785	.633	.416	.660	.826	.785	0.000	.000		.000	0.000	.750	.660	.253	.785
	N	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
5.13 No. of divided Bedrooms – 2 or more (M)	Pearson Correlation	-.077	-.062	.124	-.077	-.101	.040	.124	.062	.077	-.563**	.372*	.563**	1	.563**	-.225	.124	.320*	.282
	Sig. (2-tailed)	.628	.696	.434	.628	.525	.800	.434	.696	.628	.000	.015	.000		.000	.152	.434	.039	.070
	N	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
5.14 Principal Source of Drinking Water Supply - Piped Water Supply into Yard or Plot, tube well, Protected	Pearson Correlation	-.043	-.035	-.070	-.043	.076	.129	.070	.035	.043	-1.000**	.698**	1.000**	.563**	1	.051	-.070	.180	-.043
	Sig. (2-tailed)	.785	.826	.660	.785	.633	.416	.660	.826	.785	0.000	.000	0.000	.000		.750	.660	.253	.785
	N	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42

Well within premises (N)																			
5.15 Principal Source of Cooking Fuel - Kerosene, LP Gas, Biogas, Coal/Lignite, Electricity (O)	Pearson Correlation	.090	.073	-.290	-.225	.049	.228	.073	.308*	.540**	-.051	.073	.051	-.225	.051	1	-.073	-.047	-.225
	Sig. (2-tailed)	.571	.648	.062	.152	.757	.146	.648	.047	.000	.750	.648	.750	.152	.750		.648	.768	.152
	N	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
5.16 Quality of Drinking Water Supply - Drinkable as it is (P)	Pearson Correlation	.124	.200	-.200	-.124	-.434**	-.412**	-.314*	-.200	.124	.070	.200	-.070	.124	-.070	-.073	1	.258	-.124
	Sig. (2-tailed)	.434	.204	.204	.434	.004	.007	.043	.204	.434	.660	.204	.660	.434	.660	.648		.099	.434
	N	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
5.17 Radio (Q)	Pearson Correlation	.133	.258	-.129	-.053	.175	.028	.258	.194	.240	-.180	.032	.180	.320*	.180	-.047	.258	1	.320*
	Sig. (2-tailed)	.400	.099	.415	.737	.268	.860	.099	.219	.125	.253	.839	.253	.039	.253	.768	.099		.039
	N	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
5.18 Television(R)	Pearson Correlation	.282	.372*	.124	.282	.135	.040	.124	.062	.077	.043	-.062	-.043	.282	-.043	-.225	-.124	.320*	1
	Sig. (2-tailed)	.070	.015	.434	.070	.396	.800	.434	.696	.628	.785	.696	.785	.070	.785	.152	.434	.039	
	N	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
**. Correlation is significant at the 0.01 level (2-tailed).																			
*. Correlation is significant at the 0.05 level (2-tailed).																			

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FACTOR
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   @5.3FootBicycleC @5.4.MotorBikeD @5.5.ThreewheelerE @5.6TwoWheelTractorF @5.7FourWheelTractorG
   @5.8TruckLorryH @5.9CarI @5.10VanG @5.11TypeofHousingRoofingConcreteAsbestosRoofTileK
   @5.12TypeofHousingFloorCementCeramicTilesTerrazzoL @5.13No.ofdividedBedrooms–2ormoreM
   @5.14PrincipalSourceofDrinkingWaterSupplyPipedWaterSupplyintoYar
   @5.15PrincipalSourceofCookingFuelKeroseneLPGasBiogasCoalLigniteE
   @5.16QualityofDrinkingWaterSupplyDrinkableasitisP @5.17RadioQ @5.18TelevisionR
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   @5.8TruckLorryH @5.9CarI @5.10VanG @5.11TypeofHousingRoofingConcreteAsbestosRoofTileK
   @5.12TypeofHousingFloorCementCeramicTilesTerrazzoL @5.13No.ofdividedBedrooms–2ormoreM
   @5.14PrincipalSourceofDrinkingWaterSupplyPipedWaterSupplyintoYar
   @5.15PrincipalSourceofCookingFuelKeroseneLPGasBiogasCoalLigniteE
   @5.16QualityofDrinkingWaterSupplyDrinkableasitisP @5.17RadioQ @5.18TelevisionR
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Factor Analysis

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	Cases Used	LISTWISE: Statistics are based on cases with no missing values for any variable used.
Syntax		FACTOR /VARIABLES @5.1.LandownershipofthedwellingbyHouseholdMemberA @5.2.HouseOwnedbyHouseholdMemberB @5.3FootBicycleC @5.4.MotorBikeD @5.5.ThreewheelerE @5.6TwoWheelTractorF @5.7FourWheelTractorG @5.8TruckLorryH @5.9CarI @5.10VanG @5.11TypeofHousingRoofingConcreteAsbestosRoofTileK @5.12TypeofHousingFloorCementCeramicTilesTerrazzoL @5.13No.ofdividedBedrooms–2ormoreM @5.14PrincipalSourceofDrinkingWaterSupplyPipedWaterSupplyintoYar @5.15PrincipalSourceofCookingFuelKeroseneLPGasBiogasCoalLigniteE @5.16QualityofDrinkingWaterSupplyDrinkableasitisP @5.17RadioQ @5.18TelevisionR /MISSING LISTWISE /ANALYSIS @5.1.LandownershipofthedwellingbyHouseholdMemberA @5.2.HouseOwnedbyHouseholdMemberB @5.3FootBicycleC @5.4.MotorBikeD @5.5.ThreewheelerE @5.6TwoWheelTractorF @5.7FourWheelTractorG @5.8TruckLorryH @5.9CarI @5.10VanG @5.11TypeofHousingRoofingConcreteAsbestosRoofTileK @5.12TypeofHousingFloorCementCeramicTilesTerrazzoL @5.13No.ofdividedBedrooms–2ormoreM @5.14PrincipalSourceofDrinkingWaterSupplyPipedWaterSupplyintoYar @5.15PrincipalSourceofCookingFuelKeroseneLPGasBiogasCoalLigniteE @5.16QualityofDrinkingWaterSupplyDrinkableasitisP @5.17RadioQ @5.18TelevisionR /PRINT UNIVARIATE INITIAL KMO EXTRACTION ROTATION FSCORE /PLOT EIGEN /CRITERIA MINEIGEN(1) ITERATE(25) /EXTRACTION PC /CRITERIA ITERATE(25) /ROTATION VARIMAX /METHOD=CORRELATION.
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Descriptive Statistics			
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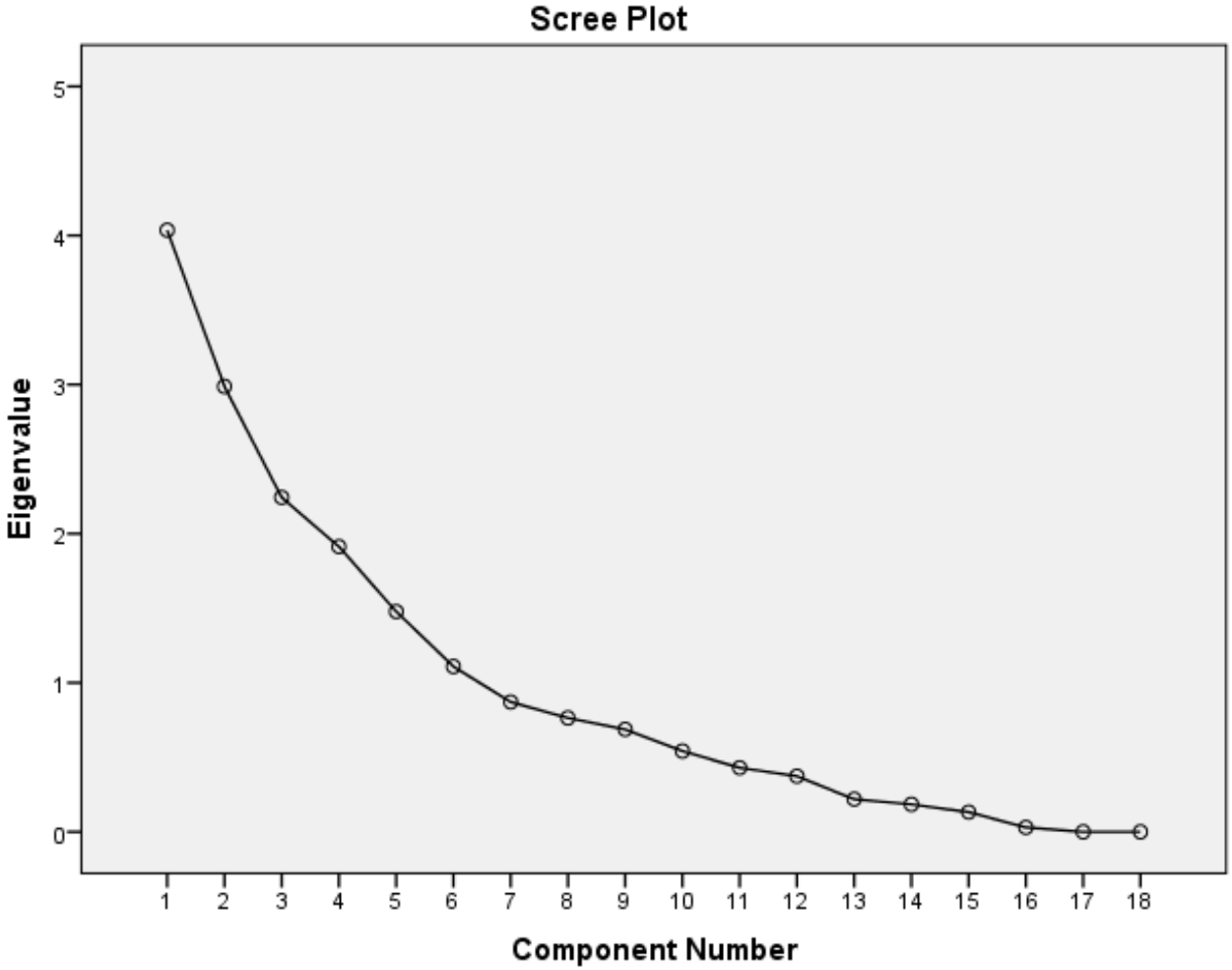
5.1. Land ownership of the dwelling by Household Member (A)	.9286	.26066	42
5.2. House Owned by Household Member (B)	.9524	.21554	42
5.3 Foot Bicycle (C)	.8333	.37720	42
5.4. Motor Bike (D)	.9286	.26066	42
5.5. Three-wheeler (E)	.1905	.39744	42
5.6 Two-Wheel Tractor (F)	.4048	.49680	42
5.7 Four-Wheel Tractor (G)	.1667	.37720	42
5.8 Truck/ Lorry (H)	.0476	.21554	42
5.9 Car (I)	.0714	.26066	42
5.10 Van (G)	.0238	.15430	42
5.11 Type of Housing (Roofing) - Concrete, Asbestos, Roof Tile (K)	.9524	.21554	42
5.12 Type of Housing (Floor) - Cement, Ceramic Tiles, Terrazzo (L)	.9762	.15430	42
5.13 No. of divided Bedrooms – 2 or more (M)	.9286	.26066	42
5.14 Principal Source of Drinking Water Supply - Piped Water Supply into Yard or Plot, tube well, Protected Well within premises (N)	.9762	.15430	42
5.15 Principal Source of Cooking Fuel - Kerosene, LP Gas, Biogas, Coal/Lignite, Electricity (O)	.0952	.29710	42
5.16 Quality of Drinking Water Supply - Drinkable as it is (P)	.8333	.37720	42
5.17 Radio (Q)	.5714	.50087	42
5.18 Television(R)	.9286	.26066	42

Correlation Matrix

a. This matrix is not positive definite.

Communalities		
	Initial	Extraction
5.1. Land ownership of the dwelling by Household Member (A)	1.000	.803
5.2. House Owned by Household Member (B)	1.000	.867
5.3 Foot Bicycle (C)	1.000	.757
5.4. Motor Bike (D)	1.000	.654
5.5. Three-wheeler (E)	1.000	.608
5.6 Two-Wheel Tractor (F)	1.000	.672
5.7 Four-Wheel Tractor (G)	1.000	.499
5.8 Truck/ Lorry (H)	1.000	.716
5.9 Car (I)	1.000	.793
5.10 Van (G)	1.000	.975
5.11 Type of Housing (Roofing) - Concrete, Asbestos, Roof Tile (K)	1.000	.828
5.12 Type of Housing (Floor) - Cement, Ceramic Tiles, Terrazzo (L)	1.000	.975
5.13 No. of divided Bedrooms – 2 or more (M)	1.000	.732
5.14 Principal Source of Drinking Water Supply - Piped Water Supply into Yard or Plot, tube well, Protected Well within premises (N)	1.000	.975
5.15 Principal Source of Cooking Fuel - Kerosene, LP Gas, Biogas, Coal/Lignite, Electricity (O)	1.000	.761
5.16 Quality of Drinking Water Supply - Drinkable as it is (P)	1.000	.814
5.17 Radio (Q)	1.000	.719
5.18 Television(R)	1.000	.617
Extraction Method: Principal Component Analysis.		

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.036	22.422	22.422	4.036	22.422	22.422	3.926	21.809	21.809
2	2.987	16.596	39.018	2.987	16.596	39.018	2.574	14.303	36.112
3	2.243	12.463	51.481	2.243	12.463	51.481	2.236	12.420	48.532
4	1.913	10.629	62.109	1.913	10.629	62.109	1.892	10.512	59.043
5	1.478	8.211	70.321	1.478	8.211	70.321	1.750	9.722	68.765
6	1.109	6.161	76.482	1.109	6.161	76.482	1.389	7.716	76.482
7	.871	4.839	81.320						
8	.764	4.245	85.565						
9	.687	3.819	89.384						
10	.542	3.009	92.394						
11	.430	2.388	94.782						
12	.373	2.075	96.856						
13	.219	1.218	98.075						
14	.184	1.024	99.099						
15	.133	.736	99.835						
16	.030	.165	100.000						
17	3.086E-16	1.714E-15	100.000						
18	-2.253E-16	-1.252E-15	100.000						
Extraction Method: Principal Component Analysis.									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Component Number

	Component					
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5.1. Land ownership of the dwelling by Household Member (A)	-.050	.524	.593	.221	-.302	.187
5.2. House Owned by Household Member (B)	-.036	.517	.692	.225	-.222	.139
5.3 Foot Bicycle (C)	-.084	-.192	.012	-.508	.255	.625
5.4. Motor Bike (D)	-.097	.200	.524	-.280	-.407	-.293
5.5. Three-wheeler (E)	.065	.641	-.275	-.270	.013	-.209
5.6 Two-Wheel Tractor (F)	.161	.631	-.240	-.114	-.219	.360
5.7 Four-Wheel Tractor (G)	.100	.596	-.115	-.330	.098	.039
5.8 Truck/ Lorry (H)	.004	.643	-.328	.068	.190	-.394
5.9 Car (I)	.143	.428	-.292	.560	.292	.325
5.10 Van (G)	-.975	.020	.024	.060	.125	.064
5.11 Type of Housing (Roofing) - Concrete, Asbestos, Roof Tile (K)	.755	-.352	.131	.189	-.217	.184
5.12 Type of Housing (Floor) - Cement, Ceramic Tiles, Terrazzo (L)	.975	-.020	-.024	-.060	-.125	-.064
5.13 No. of divided Bedrooms – 2 or more (M)	.671	-.033	.190	-.165	.464	.050
5.14 Principal Source of Drinking Water Supply - Piped Water Supply into Yard or Plot, tube well, Protected Well within premises (N)	.975	-.020	-.024	-.060	-.125	-.064
5.15 Principal Source of Cooking Fuel - Kerosene, LP Gas, Biogas, Coal/Lignite, Electricity (O)	.066	.326	-.445	.605	-.241	.168
5.16 Quality of Drinking Water Supply - Drinkable as it is (P)	.000	-.335	.422	.652	.297	-.100
5.17 Radio (Q)	.279	.358	.291	.170	.602	-.193
5.18 Television(R)	.021	.367	.531	-.266	.332	.137

	Component					
	1	2	3	4	5	6
5.1. Land ownership of the dwelling by Household Member (A)	-.040	.052	.887	.078	.046	.053
5.2. House Owned by Household Member (B)	-.039	.004	.914	.027	.160	.067
5.3 Foot Bicycle (C)	-.077	.057	-.132	-.078	.025	-.851
5.4. Motor Bike (D)	-.019	.127	.517	-.576	-.082	.179
5.5. Three-wheeler (E)	-.011	.746	.011	.029	.117	.194
5.6 Two-Wheel Tractor (F)	.131	.631	.280	.359	-.158	-.156
5.7 Four-Wheel Tractor (G)	.023	.663	.116	.040	.194	-.083
5.8 Truck/ Lorry (H)	-.122	.587	-.073	.218	.283	.473
5.9 Car (I)	.012	.117	.062	.848	.234	.049
5.10 Van (G)	-.977	-.100	.040	-.007	-.074	-.066
5.11 Type of Housing (Roofing) - Concrete, Asbestos, Roof Tile (K)	.815	-.362	.057	.096	-.113	-.083
5.12 Type of Housing (Floor) - Cement, Ceramic Tiles, Terrazzo (L)	.977	.100	-.040	.007	.074	.066
5.13 No. of divided Bedrooms – 2 or more (M)	.582	-.003	-.104	-.043	.571	-.234
5.14 Principal Source of Drinking Water Supply - Piped Water Supply into Yard or Plot, tube well, Protected Well within premises (N)	.977	.100	-.040	.007	.074	.066
5.15 Principal Source of Cooking Fuel - Kerosene, LP Gas, Biogas, Coal/Lignite, Electricity (O)	.040	.115	.085	.749	-.288	.310
5.16 Quality of Drinking Water Supply - Drinkable as it is (P)	-.035	-.769	.121	.165	.360	.221
5.17 Radio (Q)	.116	.057	.127	.124	.805	.154
5.18 Television(R)	-.056	.178	.413	-.188	.537	-.295
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.						
a. Rotation converged in 7 iterations.						

Component Transformation Matrix						
Component	1	2	3	4	5	6
1	.974	.065	-.035	.096	.190	.017
2	-.112	.751	.492	.287	.249	.191
3	.027	-.392	.718	-.437	.359	-.103
4	-.040	-.520	.187	.683	.029	.475
5	-.189	-.064	-.390	.160	.858	-.215
6	.017	-.058	.233	.475	-.190	-.825
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.						

Estimated Component Score						
Component Score Coefficient Matrix						
	Component					
	1	2	3	4	5	6
5.1. Land ownership of the dwelling by Household Member (A)	.012	-.029	.417	.060	-.068	-.034
5.2. House Owned by Household Member (B)	.006	-.050	.417	.030	.003	-.014
5.3 Foot Bicycle (C)	-.025	.042	-.013	.091	.015	-.641
5.4. Motor Bike (D)	.029	.066	.220	-.355	-.094	.196
5.5. Three-wheeler (E)	-.011	.294	-.057	-.068	.052	.141
5.6 Two-Wheel Tractor (F)	.048	.225	.148	.201	-.169	-.212
5.7 Four-Wheel Tractor (G)	-.005	.255	.010	-.008	.081	-.081
5.8 Truck/ Lorry (H)	-.059	.213	-.125	.002	.180	.339
5.9 Car (I)	-.029	-.021	.022	.472	.118	-.104
5.10 Van (G)	-.252	-.040	.006	.036	.022	-.055
5.11 Type of Housing (Roofing) - Concrete, Asbestos, Roof Tile (K)	.224	-.151	.092	.081	-.128	-.084
5.12 Type of Housing (Floor) - Cement, Ceramic Tiles, Terrazzo (L)	.252	.040	-.006	-.036	-.022	.055
5.13 No. of divided Bedrooms – 2 or more (M)	.110	-.009	-.079	-.011	.317	-.153
5.14 Principal Source of Drinking Water Supply - Piped Water Supply into Yard or Plot, tube well, Protected Well within premises (N)	.252	.040	-.006	-.036	-.022	.055
5.15 Principal Source of Cooking Fuel - Kerosene, LP Gas, Biogas, Coal/Lignite, Electricity (O)	.019	-.002	.069	.381	-.201	.102
5.16 Quality of Drinking Water Supply - Drinkable as it is (P)	-.035	-.343	.045	.108	.239	.152
5.17 Radio (Q)	-.026	-.019	-.033	.028	.475	.109
5.18 Television(R)	-.037	.051	.145	-.068	.282	-.217

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization

Component Matrix for calculating HHAI

Component Matrix	Component					
	1	2	3	4	5	6
5.1. Land ownership of the dwelling by Household Member (A)	-0.0000563465	0.0001347951	-0.0019194947	-0.0002750298	0.0003120492	0.0001585863
5.2. House Owned by Household Member (B)	-0.0000225714	0.0001868145	-0.0015473640	-0.0001110666	-0.0000110232	0.0000528836
5.3 Foot Bicycle (C)	-0.0000939514	0.0001569397	-0.0000482431	0.0003375597	0.0000555908	-0.0023795978
5.4. Motor Bike (D)	-0.000133343	-0.000305619	-0.00101399	0.001632031	0.000434582	-0.000902141
5.5. Three-wheeler (E)	0.0000273188	-0.0007402987	0.0001430224	0.0001702762	-0.0001304188	-0.0003545390
5.6 Two-Wheel Tractor (F)	-0.000154762	-0.000723731	-0.000476348	-0.000645899	0.0005433	0.00068311
5.7 Four-Wheel Tractor (G)	0.0000174554	-0.0009466149	-0.0000379701	0.0000303338	-0.0003021931	0.0003023378
5.8 Truck/ Lorry (H)	-0.0002182061	0.0007899801	-0.0004651594	0.0000079464	0.0006687264	0.0012565997
5.9 Car (I)	-0.0001337870	-0.0000962289	0.0001004448	0.0021737034	0.0005416408	-0.0004794612
5.10 Van (G)	-0.0006535984	-0.0001035602	0.0000156611	0.0000942532	0.0000577547	-0.0001416827
5.11 Type of Housing (Roofing) - Concrete, Asbestos, Roof Tile (K)	-0.000830394	0.000560278	-0.000340368	-0.000302215	0.000473418	0.000310574
5.12 Type of Housing (Floor) - Cement, Ceramic Tiles, Terrazzo (L)	-0.0006535984	-0.0001035602	0.0000156611	0.0000942532	0.0000577547	-0.0001416827
5.13 No. of divided Bedrooms – 2 or more (M)	-0.0005073567	0.0000409172	0.0003622264	0.0000529002	-0.0014607772	0.0007062454
5.14 Principal Source of Drinking Water Supply - Piped Water Supply into Yard or Plot, tube well, Protected Well withinpremises (N)	-0.0006535984	-0.0001035602	0.0000156611	0.0000942532	0.0000577547	-0.0001416827
5.15 Principal Source of Cooking Fuel - Kerosene, LP Gas, Biogas, Coal/Lignite, Electricity (O)	0.0001024465	-0.0000109717	0.0003693531	0.0020530356	-0.0010801609	0.0005506649
5.16 Quality of Drinking Water Supply - Drinkable as it is (P)	-0.000131149	-0.001272703	0.000165244	0.000400237	0.000885824	0.000564591
5.17 Radio (Q)	-0.0000625816	-0.0000447842	-0.0000795255	0.0000667203	0.0011369039	0.0002617797
5.18 Television(R)	0.000171302	-0.000232856	-0.000668117	0.000312557	-0.001297727	0.001000662
Avg	-0.0002214845	-0.0001563758	-0.0003005170	0.0003436583	0.0000523888	0.0000726249
Max	0.0001713020	0.0007899801	0.0003693531	0.0021737034	0.0011369039	0.0012565997

Min	-0.0008303939	-0.0012727031	-0.0019194947	-0.0006458995	-0.0014607772	-0.0023795978
Avg-Min	0.0006089094	0.0011163273	0.0016189777	0.0009895578	0.0015131660	0.0024522227
Max-Mini	0.0010016959	0.0020626832	0.0022888478	0.0028196028	0.0025976811	0.0036361976
Composite HHAI	60.78785054	54.12015421	70.73330547	35.09564407	58.25064381	67.43920487
Overall Composite HHAI	57.7378					