EVALUATING SMART AGRICULTURAL VILLAGE PROGRAM IN NEPAL: A MIXED METHOD APPROACH

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Abstract

This study uses a mixed-method approach to evaluate an agricultural program run by the Provincial Government of Nepal. In the qualitative study, a field interview was used for data collection, and content analysis was used to capture the sentiments of 51 farmers toward the affiliated agricultural program. A quantitative method was used to evaluate the satisfaction of farmers taking an attitude survey of 204 respondents affiliated with the agricultural program. A qualitative study explored the need for affiliated farmers to the program. Quantitative analysis using a PLS-SEM tested a proposed conceptual model. Support services such as capacity-building training and knowledge-enhancing orientations are necessary for the farmers as explored in the qualitative study. The quantitative study confirmed that the existing support services and training are insufficient to influence the satisfaction of the farmers after affiliation with the program. Triangulation of the data and analysis concludes that government subsidy is only not sufficient for farmers to make them productive, a strong support mechanism is essential in the agricultural sector.

Keywords: agricultural program; mixed method; triangulation; PLS-SEM

1. Introduction

Evaluating the achievement of programs in the public sector is essential. Developing and underdeveloped countries run several developmental programs to uplift people's living standards. A large sum of money is spent on such programs annually. An estimated government spending of about USD 413 billion in 2010 to USD 613 billion in 2019 is made on the agricultural sector globally (Brief, 2019). It is always desirable to evaluate various perspectives and methods whether such spending has fulfilled beneficiaries' needs rightly or not. Proper utilization of such funds is always questionable. There is an opinion line that subsidies and cash flows to public enterprises such as in the agriculture sector are a total waste of resources, it reduces efficiency, degrade productivity and merely support the vested interests of politicians, as well as make beneficiaries idle to fulfill objective functions of politicians (Andrei Shleifer & Bobert W.Vishny, 1994).

In the next opinion line, the philosophy of subsidies justifies equitable distribution of resources is essential to bring the marginalized and lower strata of society towards better living standards and helps in the upward mobility of the strata. Developing countries are dependent on contributions from agricultural sectors for improving their economy. There is a strong role of agricultural

productivity as a driver of structural change in the economy of a country (Arouna et al., 2021; McArthur & McCord, 2017; Tambo et al., 2021) Careful design and implementation of production provisions in the agricultural sector permits for better vertical coordination, improves the productivity and income of farmers, it has a positive effect in commercialization as well as help develop the rural transformation substantially (Arouna et al., 2021).

Some studies on subsidies in agriculture in the form of direct payments have found heterogeneous effects on productivity. A study carried out in Kosovo shows that direct payments associated with fruit and vegetables have an identifiable positive effect on the commercialization of fruit and vegetable production, it finds direct payments for cereal and oilseeds support a positive effect on market participation but fails to find any significant effect of direct payments for livestock rearing on market participation (Kostov et al., 2021). In a study, plant clinics in Rwanda helped maintain food security and reduce food shortage. It helped 88% reduction in the severity of food insecurity, suggesting that the plant health advisory services by plant clinics in Rwanda contributed to improving household food security (Tambo et al., 2021)

A selected case of women farmers in honey cooperatives in Ethiopia confirms the positive effects of collective action on output price (Bernard et al., 2008) and on production levels (Chagwiza et al., 2016) but access to market creates one of the main constraints (Serra & Davidson, 2021). Policymakers in countries can foster methods to facilitate entrepreneurs' access to capital so that they can buy more inputs for increased production reinforcing entrepreneurs' social networks (Babah Daouda et al., 2019) Such programs help connect small-scale producers at the bottom or base of the pyramid with high-income markets and assist to move such producers out of poverty (Adekambi et al., 2018; Theocharidis et al., 2018).

This study assumes a government-aided agricultural program as a government-designed product offered to farmers and uses a marketing perspective to evaluate how successful is the program to deliver farmers' needs. Marketing discipline can play an important role in assisting policymakers in analyzing the dynamism and complexity of markets (Vargo and Lusch 2017); business practices, and societal needs (Stewart 2015; Verplanken and Wood 2006); and evaluating potential responses to government interventions (Shultz et al. 2012). Yet the relevance of marketing for public policy has been questioned because of its predominant focus on the exchange paradigm, which, according to Hill and Martin (2014, p. 18), "fails to consider the systemic realities (Peterson & Godby, 2020; Trischler & Charles, 2019).

This study assumes the subsidy in the form of direct cash transfer in a selected agricultural program by the provincial government in Lumbini Province in Nepal. The provincial government started this program in 2019 in 52 municipalities of 12 districts of Lumbini Province in Nepal. The program was named as Smart Agricultural Village Program (SAVP) and came into effect to bring sustainable growth in farmers' income through market-oriented and profitable farm operations using innovative and climate-resilient technologies. The SAVP has emphasized the use of site-specific crops, vegetables, and livestock rearing. The program includes six components for operation and four measurable goals. Climate Smart, Irrigation Smart, Nutrient Smart, Technology Smart, Market Smart, and Inter-related Sectors are its six components. Similarly, adopting Site-Specific Climate Resilient Technologies and Practices, doubling the income level of farmers, creating employment opportunities in villages, and ensuring sustainable food security are its four goals.

This paper aims to evaluate the SAVP program conducted in Lumbini Province in Nepal by triangulation approach. The qualitative study uses content analysis of the data collected from 51 farmers using unstructured interviews and open-ended questions from field visits in 7 specific

sites. Similarly, quantitative analysis using PLS-SEM tests a conceptual model to evaluate the influence of public participation, employability, and support services on satisfaction and continuance commitment of beneficiaries and hence the word of mouth of the agricultural program by collecting self-administered survey questionnaires data from 204 farmers in next 6 sites out of 46 sites. By triangulating the data and analysis from qualitative and quantitative analysis, the study explores and verifies the same result that SAVP lacks influential support services for the farmers.

This paper consists of an introduction, two studies- study 1 and study 2, triangulation, finding, conclusion, implications, and directions for future research. Study 1 is an explorative study to capture the sentiments of farmers after affiliating with SAVP two years ago. Study 2 is based on a conceptual model that tests the influence of public participation, employability, and support services on the satisfaction and continuance commitment of beneficiaries and hence on word of mouth of the agricultural program.

2. Study 1: Exploratory Study

First, this study starts with an exploratory study that intends to clarify the exact nature of the problem and it aims to bring the underpinnings of the phenomenon under investigation. The usual method of investigation in exploratory research is the qualitative method. The qualitative method gives a holistic picture of the phenomenon and explains the phenomenon richly based on data collected from respondents (John W. Creswell, 2009). Researchers are using qualitative methods to explore the phenomenon in agricultural studies (Botsiou et al., 2018; Serra & Davidson, 2021; Theocharidis et al., 2018; Theodorou & Tzovenis, 2017). In the exploratory study, a semi-structured interview of 51 farmers was used for data collection and subsequently to generate the type of meaning and level of understanding of beneficiaries. The sentiments collected were analyzed by NVIVO to capture the meaning and its potential direction of interpretation. Open-ended field interviews explored the existential meaning of the project, then provided the existence of the intended dimensions of the project and successively evaluated the performance of the implemented project in the sites for targeted beneficiaries.

2.1 Method

The explorative study was designed to map the sentiments of farmers in 2021 A.D. after affiliation to the SAVP in 2019 A.D. An extensive field visit was carried out to collect the opinions of farmers using unstructured interviews and open-ended questions regarding their feelings and experiences after being associated with the SAVP. Those farmers affiliated with the SAVP received direct payments or cash transfers on behalf of the agricultural program after fulfilling certain terms and conditions.

2.3 Data collection and semi-structured interviews

Smart Agricultural Village Program (SAVP) was designed to uplift the living standards of farmers in the Lumbini Province of Nepal. In 2019 A.D., 52 sites each one from 52 constituencies of 12 districts were selected for running the three programs- vegetable farming, crops, and livestock rearing. Out of 52 sites, 46 sites were only running the programs and provincial governments provided cash transfers to farmers after farmers completed predefined terms and conditions. Seven sites were selected for collecting qualitative data. In twelve districts, 51 farmers' semi-structured interview was conducted and answers to open-ended questions were collected. Farmers were contacted through the Farmers' Group and consent was

taken to collect the data. The semi-structured interview lasted from at least 45 minutes to at most 65 minutes. Seven sites were selected from convenient sampling – two from hilly geographical regions, two from plain geographical regions, one from the easternmost part of the province, next from the westernmost part of the province, and the remaining one from the very remote part of the province.

A semi-structured questionnaire (Table 1) was developed using the extant literature and consulting with two marketing experts. A request letter was sent to Farmers' Groups to participate in field interviews. Only the responses of willingly participating farmers were recorded and transcribed. The intent of the data collection through open-ended questions was to map the sentiments of farmers in the SAVP affiliation.

Table 1 Semi-structured questionnaire

S. No.	Questions
1	What is your perspective on this program?
2	What are your expectations from the program?
3	How do you relate yourself to this subsidized agricultural program?
4	Do you feel any life-changing effects from the program?
5	What would you do if you were in government to make the program successful?

Coding, grouping, and analysis

Table 2 Word Frequency

Word	Count	Weighted Percentage (%)
Necessary	65	10.43
Training	29	4.65
Technical	24	3.85
Market	17	2.73
Support	14	2.25
Counseling	12	1.93
Good	11	1.77
Monitoring	11	1.77
Regular	11	1.77

The field interviews were transcribed and analyzed line by line by the researcher. The contents were analyzed using NVivo to form a word cloud. The responses emphasized the themes producing different keywords. The frequency table and percentage of repetition of the words are in Table 2.

Table 3 Sentiment Analysis

Codes	Number of coding references
Total Codes	101
Mixed Codes	3
Negative Codes	2
Neutral Codes	82
Positive Codes	14

Sentiment analysis produced neutral, positive, and mixed themes in coded data. In aggregate the sentiment analysis captures neutrality sentiment of the farmers; rather farmers are more positive but less negative towards the agricultural program.

2.4 World Cloud

The transcript of the data collected from semi-structured interviews and open-ended questions was further consolidated. It was analyzed using N-Vivo to form a word cloud (Figure 1). The size of each word generated in the word cloud is directly proportional to the frequency of the transcribed data. The words- necessary, training, technical, market, support, counseling, good, monitoring, and regular are highly repeated words respectively.

Figure 1 Word cloud of open-ended questions/field interview

2.5 Findings

Semi-structured field interviews of farmers captured the perspectives of farmers about SAVP. The content analysis generated keywords directing them to tap the experience of farmers after affiliating with the program. Necessary, training, technical, market, support, counseling, good, monitoring, and regular are highly repeated word respectively when content was analyzed. The findings from the explorative study can be summarized with the help of the word cloud. Farmers' sentiment analysis from qualitative data showed that the farmers carry neutral experiences and positive sentiments after affiliating with the SAVP. We can say farmers are willing to affiliate with the program.

World cloud can be interpreted by weaving the words into meaningful sentences and linking the sentences to farmers' opinions. Farmers feel good about the program. Support services, technical training, regular monitoring, and counseling are necessary. Farmers expect an easy market for selling agricultural produce. Farmers hope for the continuity of the SAVP with technical training and support services together with regular monitoring and counseling for feedback on agricultural activities.

3. Study 2: Quantitative Study

Subsidies in agricultural programs are designed to make farmers better off, it is for Welfare economics to work in general peoples' life. Such programs focus on how policies affect individual needs and create Pareto optimality criteria for win-win opportunities to satisfy the preferences of people to the greatest extent possible without making anyone worse off. Public opinion surveys have been used explicitly to measure the general public's satisfaction with a variety of issues related to public policy. Public administration scholars have used customer satisfaction models from marketing literature from private-sector contexts and applied them as a metric for assessing government-run services (Kettl, 1994). Concepts related to satisfaction are found to have a firm basis in many social science and evaluation fields. This study adopts the satisfaction of farmers with the affiliated agricultural program for evaluating the extent of the program's perceived effectiveness and efficiency in fulfilling farmers' needs using social-exchange theory. Social- exchange theory stands on the mutual sharing of benefits between two parties under the conditions that net benefits exceed associated costs (Cropanzano & Mitchell, 2005; Redmond, 2015). Participants' satisfaction data collected from surveys and interviews can provide meaningful inferences forming a basis for evaluating whether designed benefits have been transferred to target groups or not (Coglianese, 2005; Ogunlana et al., 2016; Taleghani & Mehdizade, 2016; Yu et al., 2021). Concepts related to customer satisfaction in marketing literature are widely used in social sciences to assess the dyadic relationship of exchange of benefits (Kumar et al., 2013; Westbrook, 1987; Wong, 2004).

Measuring performance through satisfaction and continuance commitment

Several studies have shown that performance or bundle of benefits offered to customers affects satisfaction (Liljander & Strandvik, 1995; Mathison, 2013; Spake et al., 2003; Woodruff et al., 1987). Performance is the ability of the program's offering to fulfill the needs, want, or desire of beneficiaries. The effectiveness of such programs is measured by farmers' 'perceived level of employability', public participation, support services, and intention to continue the affiliation with the program in the future. Hence this study has attempted to measure the performance of the program by assessing how successful is the program to generate self-rating

employability of farmers, practice of public participation and received support services; and subsequently evaluating their intent to continue to affiliate to the program. We have assumed satisfied farmers with the program intend to continue the affiliation with the program in the future too and spread positive word of mouth about the agricultural program.

Employability, Satisfaction, and Continuance Commitment

Improving the living standard of people generating stable income through sustainable employability is one of the major objectives of all policy programs (Bozionelos et al., 2016; Fugate et al., 2004; Garrone et al., 2019; Gupta et al., 2016; Hamilton et al., 1993; van Tongeren, 2008). The concept of employability came into use around 1955 (Versloot, Glaudé, & Thijssen, 1998). Several historical overviews shed some light on the development of its conceptualization and definitions (Thijssen & Van der Heijden, 2003; Van Lammeren, 1999; Versloot et al., 1998). Employability is studied from different angles and distinct levels (individual, organizational, and industrial) across a wide range of academic disciplines, such as business and management studies, human resource management, human resource development, psychology, educational science, and career theory. This study assumes the criteria of the competence-based approach to employability, employability (1) is advantageous for both career outcomes and firm outcomes, (2) is advantageous for both present performance on the job as well as career outcomes (long-term performance, implying the process of adaptation and learning), (3) in addition to adaptive behavior, may include personal elements such as personality, attitudes, motivation, and ability, and (4) represents the combination of specific and more generic competences (Bozionelos et al., 2016). The ability of the agricultural program that provides subsidies to affiliated farmers is measured by the perceived level of employability of the farmers. If farmers can experience an increase in their income after affiliating with the program, then it can be concluded that the program is effective in terms of creating jobs- the employability dimension of the program is attained. Based on the discussion above, the hypotheses are set as:

H1: There is a significant influence of the employability of the SAVP program on the satisfaction of affiliated farmers.

H2: There is a significant influence of the employability of the SAVP program on the continuance commitment of affiliated farmers.

Public participation, satisfaction, and continuance commitment

Empowerment of people through the policy programs is also one of the major objectives and it is achieved through the practice of public participation by people through affiliated programs (Abelson, 2006; Layson & Nankai, 2015; Okbay et al., 2016). A high level of public participation generates ownership and ownership of an entity results in satisfaction (Marks & Davis, 2012). Public participation enhances positive behavioral outcomes resulting in an intention to continue in the value exchange process and the expectation of future benefits is the main driver of continuance behavior (Fred Wali et al., 2015). Community participation has been a major antecedent in community development practice and development partners need to encourage the participation of beneficiaries as a tool to augment their satisfaction to drive the developmental program's effective sustainability (Ananga et al., 2016, 2020; Peterson & Godby, 2020). Participatory roles transfer a form of authority delegation and make beneficiaries behave responsibly resulting in positive outcomes for the development projects (Prokopy & Lafayette, 2005). There is an increased emphasis given to the role of public participation in development projects to build up satisfaction and future association in similar projects (Pollard & Court,

2021). Hence, we draw the proposition that participation makes people's engagement in the development projects satisfied and encourages beneficiaries' future affiliation. The following hypotheses are formulated based on the presented discussions.

H3: There is a significant influence of public participation on the satisfaction of affiliated farmers in SAVP.

H4: There is a significant influence of public participation on the continuance commitment of affiliated farmers in SAVP.

Support services, satisfaction, and continuance commitment

Service-Dominant Logic (Ng & Vargo, 2018; Vargo & Lusch, 2004) brings evidence that all products and programs need service element essentially for value exchange and the concept works as a foundation for the transfer of benefits from service providers to service receivers in every sector of the modern economy. Services and support activities are essential in beneficiary management except for basic functions of the product to make the efficient performance of value delivery (Fred Wali et al., 2015; Soliman, 2011). The core of any support services ultimately lies in the quality of the maintenance of shortages in programs and updating the deliverables for effectiveness that can be offered to customers (Durugbo, 2020; Killham, 2003; Piza et al., 2016; Rolstadaas et al., 2008; Shahrouzifard & Faraji, 2016; Trischler & Charles, 2019; van Tongeren, 2008). Support services prevent the switching of farmers from the programs (Liljander & Strandvik, 1995; Peterson & Godby, 2020). Customer satisfaction with the program's support services indicates the effectiveness of the program (Carvalho & de Oliveira Mota, 2010; Spring & Araujo, 2009). Hence the support services of the program show association with the satisfaction of farmers affiliated with the SAVP.

H5: There is a significant influence of support services of the SAVP program on the satisfaction of affiliated farmers.

H6: There is a significant influence of support services of the SAVP program on the continuance commitment of affiliated farmers.

Satisfaction, Continuance Commitment, and Positive Word-of-Mouth

There are several pieces of evidence that commitment results from satisfaction because satisfaction initiates a rationalization process towards forming attitudes consistent with behavior and it is observed through the positive word of mouth of individual beneficiaries (Bateman & Strasser, 1984). Satisfaction is an overall evaluation of the service product, and it comes into effect as the consequence of service consumption (Yasvari et al., 2012). Continuance commitment and positive word of mouth are the behavioral outcomes of satisfied customers, and those outcomes act as the future intention to affiliate or repurchase the service product (Rizwan et al., 2014; Wu & Li, 2018). Satisfied individuals exhibit loyal and continuing behavior in relationships and spread positive word-of-mouth about the relationship (Mellens et al., 1995; Nyffenegger et al., 2015; Osuna Ramírez et al., 2017; Palmatier et al., 2006; Somers, 1995; Spake et al., 2003). Surveys or in-depth interviews are used to assess participants' levels of satisfaction and their perceptions about what was achieved from the public policy programs (Layson & Nankai, 2015).

H7: There is a significant influence of satisfaction on the continuance commitment of farmers.

Finally, highly satisfied farmers spread positive word of mouth about the programs. Satisfaction mediates the relationship between a set of independent variables in the conceptual model and word of mouth.

H8: Continuance commitment mediates the relationship between satisfaction and word of mouth about the SAVP.

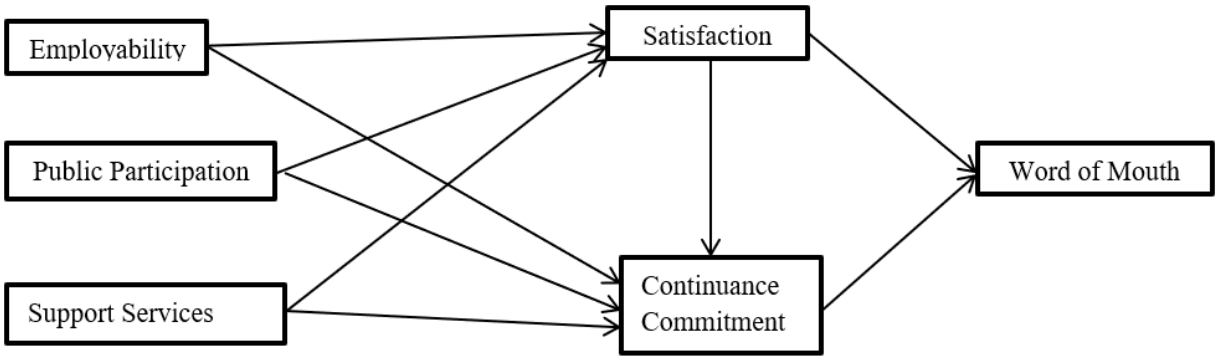

Figure 2: Conceptual Model

3.1 Method

For quantitative analysis, descriptive survey research design was used in the study. Enumerators facilitated filling out the questionnaire survey by visiting the farmers in the field.

3.2 Instruments

A team of five experts was used in the translation of scales from English to the local language. Two assistant professors of marketing, two experts from the agricultural sector, and one English language expert were engaged in the process to retain the content validity of the scales while using them in the local language. Six instruments were used for capturing the responses. The satisfaction scale by Oliver (1997) was adapted and modified for capturing responses with three items in it. Word of Mouth scale consists of three items taken and adapted from (Zeithaml, Valarie A., 1996). Similarly, the scale to capture support services is a sub-scale taken and modified from the responsiveness dimension of the SERVQUAL instrument by (Berry et al., 1988). Continuance Commitment is a sub-scale, and it was modified and adapted from a three-component commitment scale (Allen & Meyer, 1990). Employability was measured by a sub-scale with three items adapted and modified from the self-rated Employability scale (Heijde & Heijden, 2006). The public Participation scale is based on the participation depth study (Zenker & Seigis, 2012) and it was adapted and modified for capturing the participation behavior of the farmers in agricultural-related programs and sessions.

At first, two assistant professors of marketing, two experts in agricultural sectors, and one English language expert were individually and separately asked to translate the items of the scales into the local language. And then, the same group of people was asked to sit together to finalize the items in such a way that these items would carry similar meanings as in original items. The researcher moderated the discussion of the experts' team briefing about the research design and objectives. The experts' panel finalized the items, and the set of items were delivered to 10 farmers to see whether they would understand and respond to it conveniently. Farmers' suggestions were incorporated after pilot testing to make questionnaires understandable in the local language. Items and wordings were modified by the experts by maintaining the essence unchanged as far as possible to make items interpretable by farmers. After this, the scales with

items in the local language were administered for the field survey. Enumerators visited the sites and collected the responses physically.
All the items were evaluated using a five-point Likert scale based on the rating of 1 for strongly disagree, 2 for disagree, 3 for neutral, 4 for agree, and 5 for strongly agree.

3.2 Sampling and data collection procedure

Smart Agricultural Village Program (SAVP) was designed to uplift the living standards of farmers in the Lumbini Province of Nepal. In 2019 A.D., 52 sites each one from 52 constituencies of 12 districts were selected for running three programs simultaneously in each site- vegetable farming, crops, and livestock rearing. Out of 52 sites, 46 sites were only running the programs and provincial governments provided cash transfers to farmers after farmers completed predefined terms and conditions. Seven sites were selected for collecting quantitative data. In twelve districts, 250 farmers were selected randomly to participate in self-administered survey questionnaires facilitated by 7 enumerators, and the survey was assisted by the SAVP coordinator of the Farmers' Committee in communicating and rapport building. Farmers were informed that participation in the survey was optional. Seven enumerators visited seven sites in five districts to conduct the survey. Enumerators were trained to conduct the survey. Farmers were informed and requested in advance to participate in the survey. Later, enumerators visited the farmers face to face and got the questionnaires filled in on the farm individually.

3.3 Measurement Model and Analysis

Partial Least Squares- Structural Equation Modeling is used to assess the models for quantitative analysis. PLS-SEM is a suitable tool if the path model is relatively complex; the goal is to predict and explain a key target construct/ and to identify its relevant antecedent constructs (Hair et al., 2018; Leguina, 2015; Sarstedt et al., 2016, 2019). PLS-SEM involves two different stages. First, reflective measurement and formative measurement of constructs should be performed. If the measurement models with reflective and formative constructs meet all the criteria, researchers can use a structural model.

3.4 Assessment of reflective measurement model

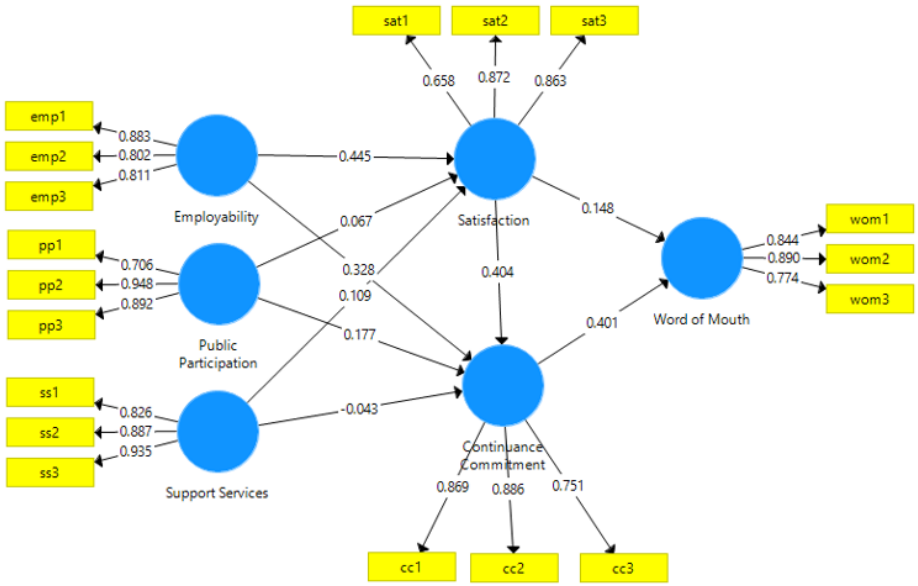

Figure 3 Measurement model with indicators' loadings

The starting step to reflective measurement or outer model is examining the factor loadings of each observable or indicator in the constructs. Factor loadings should be greater than 0.70 so that the construct explains more than 50 percent of the indicators' variance. The factor loadings are in Table 4.

Table 4: Constructs, codes, items, loadings, and p-values

Continuance Commitment-Reflective		Loadings	p-values
cc1	I would like to continue this farming business in the future too.	0.869	0.000
cc2	I would like to expand it more within one/two years.	0.886	0.000
cc3	I expect more assistance from governments in this same farming business.	0.751	0.0000
Employability- Formative			
emp1	I have been able to increase my sales after my affiliation with this program.	0.883	0.000
emp2	I have been able to sell my products in the market after my affiliation with this program.	0.802	0.000
emp3	I have been able to increase my income after my affiliation with this program.	0.811	0.000
Public participation-Formative			
pp1	I have been regularly participating in the program's productive activities.	0.706	0.000
pp2	I am regularly present in meetings held by the program.	0.948	0.000
pp3	I have taken part in training courses organized by the program.	0.892	0.000
Satisfaction-Reflective			
sat1	My choice to connect with this program was a wise one.	0.658	0.00
sat2	Working under the assistance of this program has been a good experience.	0.872	0.000
sat3	I have chosen a good program to work with.	0.863	0.000
Support Services-Formative			
ss1	If I request, I get technical service timely.	0.826	0.000
ss2	I obtain support services promptly.	0.887	0.000
ss3	I get capacity-building training immediately after my request.	0.935	0.000
Word of Mouth-Reflective			
wom1	I would say positive things about this program to other people.	0.844	0.000
wom2	I would recommend this program's assistance to other farmers who seek my advice.	0.890	0.000
wom3	I would encourage friends and relative farmers to connect to this	0.774	0.000

	program.		

Note: Loadings are greater than 0.70 (except sat1) and all are significant at 0.000.

In the second step, the internal consistency reliability of the constructs should be assessed. The values are assessed by multiple criteria- Cronbach alpha (α), composite reliability score, and rho (ρ). Cronbach alpha (α) and composite reliability score should be greater than 0.70, and the value of rho (ρ) should lie in between the value of Cronbach alpha and composite reliability.

The third step in the reflective measurement model is to assess the convergent validity of the constructs. Convergent validity is the extent to which the construct converges to explain the variations in indicators. It is measured by using the Average Variance Extracted (AVE) of all items of a construct. AVE value should be greater than 0.50 for an acceptable construct. It is calculated by the mean value of the sum of the squares of factor loadings of items in a construct. Higher above 0.50 is a better measure of convergence of the construct.

The fourth step of reflective measurement is assessing the discriminant validity of the constructs. Discriminant validity can be assessed by (a) using Fornell-Larcker's (1981) criteria or (b) using the Heterotrait-Monotrait ratio (HTMT) ratio. If the value of the square root of AVE of a construct is greater than inter construct correlation, then two constructs are discriminant otherwise not. Using the HTMT ratio of the correlation, if the correlation coefficient between two constructs is below 0.85, then these two constructs are discriminant. If the value of the HTMT correlation coefficient is near 1.0, then two constructs overlap or measure the same concept. The assessment of convergent and discriminant validity using multiple criteria is in Table 5.

Table 5 Cronbach's Alpha, Reliability (ρ_I), Composite Reliability (ρ_c), and AVE

Constructs	Cronbach's Alpha (α) > 0.70	Reliability (ρ_I) > 0.70	Composite Reliability (ρ_c) > 0.70	Average Variance Extracted (AVE) > 0.50
Continuance Commitment	0.785	0.797	0.875	0.701
Employability	0.783	0.816	0.871	0.694
Public Participation	0.820	0.951	0.889	0.731
Satisfaction	0.738	0.813	0.844	0.646
Support Services	0.868	0.999	0.914	0.781
Word of Mouth	0.788	0.814	0.875	0.701

Note: Values with headings indicate acceptable threshold.

3.5 Assessment of formative measurement model

Formative measurement models are assessed based on the following criteria: (a) convergent validity, (b) indicator collinearity, (c) statistical significance, and (d) relevance of the indicator weights (Hair et al., 2018). Hair et al. (2018) suggest that the correlation of the formatively measured construct with the single-item construct, measuring the same concept, should be 0.70 or higher. The value of loading of each indicator in the present analysis is above 0.70 except Sat1 of satisfaction which is 0.659, but it can be accepted as it is closer to 0.7 and does not create a major problem in measurement. If we remove it, the content validity of the construct is questionable.

The variance inflation factor (VIF) is used to assess the collinearity of the formative indicators. With a rigid criterion, VIF values of 3 or above indicate critical collinearity issues among the indicators of formatively measured constructs. Ideally, the VIF values should be close to 3 and lower. Here the value of VIF is all below 3, hence measurement does not bring the issue of collinearity.

In the third and final step, researchers need to assess the indicator weights' statistical significance and relevance (i.e., size). According to Hair et al. (2017a), indicators with a non-significant weight should be eliminated if the loading is also not significant. A low but significant loading of 0.50 and below suggests that one should consider deleting the indicator. In the present analysis, all the indicators' loadings are above 0.50, hence the criteria are fulfilled.

In terms of constructs measurement, satisfaction, continuance commitment and word of mouth have reflectively specified measurement models fulfilling all the necessary criteria with three items of each; and employability, public participation, and support services have fulfilled the criteria of formative measurement models. Now, we can proceed with the structural measurement model.

3.6 Assessment of structural model

In PLS-SEM, standard assessment criteria are the coefficient of determination (R2), the blindfolding-based cross-validated redundancy measure Q2, and the statistical significance and relevance of the path coefficients. We can use out-of-sample prediction power by using the PLS prediction procedure.

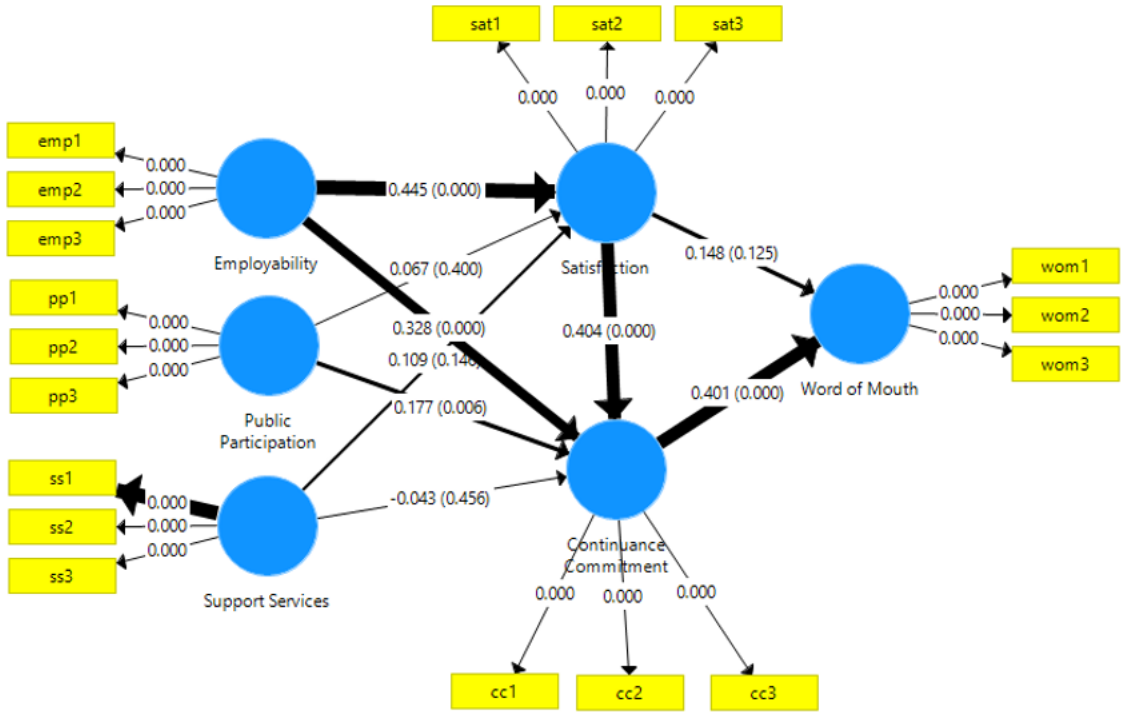

Figure 4 Structural models with path coefficients and statistical significance.

The R-square value stems from the number of constructs in the study. The larger the number of constructs of a concept taken in the study, the higher the value of the R-square. So it depends on the context of the study. Low R-square does not necessarily mean the study is not robust rather it tells us there are still many other variables that influence the target variable in the study. It is not feasible to operationalize all such variables in a single study. The values of path coefficients, R2 and f2, and predictive validity (Q2) are in Table 6.

Table 6: Heterotrait-Monotrait Ratio (HTMT) for discriminant validity

Constructs	Continuance Commitment	Employability	Public Participation	Satisfaction	Support Services
Employability	0.682				
Public Participation	0.376	0.293			
Satisfaction	0.729	0.557	0.232		
Support Services	0.115	0.176	0.194	0.218	
Word of Mouth	0.606	0.625	0.358	0.464	0.185

Note: If the correlation between two constructs is less than the threshold value i.e., 0.85, then the two constructs are strictly distinct. If the correlation lies between 0.85 and 0.95, then constructs weakly share a common concept; if the correlation value is above 0.90, then the constructs are strictly identical.

In terms of construct measurement, satisfaction, continuance commitment and word of mouth have reflectively specified measurement models fulfilling all the necessary criteria with three items of each; and employability, public participation, and support services have fulfilled the criteria of formative measurement models.

Table 7: Items and VIF values

Indicator Code	Items	VIF
cc1	I would like to continue this farming business in the future too.	1.978
cc2	I would like to expand it more within one/two years.	2.085
cc3	I expect more assistance from governments in this same farming business.	1.374
emp1	I have been able to increase my sales after my affiliation with this program.	1.793
emp2	I have been able to sell my products in the market after my affiliation with this program.	1.732
emp3	I have been able to increase my income after my affiliation with this program.	1.476
pp1	I have been regularly participating in the program's productive activities.	1.498
pp2	I am regularly present in meetings held by the program.	2.812
pp3	I have taken part in training courses organized by the program.	2.416
sat1	My choice to connect with this program was a wise one.	1.445
sat2	Working under the assistance of this program has been a good experience.	1.914
sat3	I have chosen a good program to work with.	1.482
ss1	If I request, I get technical service timely.	2.155
ss2	I obtain support services promptly.	2.334
ss3	I get capacity-building training immediately after my request.	2.339
wom1	I would say positive things about this program to other people.	1.663
wom2	I would recommend this program's assistance to other farmers who seek my advice.	1.892
wom3	I would encourage friend and relative farmers to connect to this program.	1.542

Note: VIF value below 3.0 does not bring any collinearity issue.

Table 8: Path coefficients of the structural model and significance testing results

Hypotheses	Path coefficients	Significant	f^2 – effect size	Q^2 effect size	Adjusted R^2
Continuance Commitment -> Word of Mouth	0.401	0.000	0.142	0.22	0.245
Employability -> Continuance Commitment	0.328	0.000	0.153		
Employability -> Satisfaction	0.445	0.000	0.244		
Public Participation -> Continuance Commitment	0.177	0.006	0.055	0.189	0.233
Public Participation -> Satisfaction	0.067	0.400	0.005		
Satisfaction -> Continuance Commitment	0.404	0.000	0.234	0.158	0.461
Satisfaction -> Word of Mouth	0.148	0.125	0.019		
Support Services -> Continuance Commitment	-0.043	0.456	0.003		
Support Services -> Satisfaction	0.109	0.140	0.015		

Note: 1. According to Pearson's determination coefficient values, $R^2 = 0.02$ is small, $R^2 = 0.13$ is average and $R^2 = 0.26$ has large effects.

2. Q-square >0 is acceptable. For f-square values, 0.02, 0.15, and 0.35 are considered small, average, and large effect sizes respectively.

3. Here, f- square, and Q-square values are used only when the dependent variables are explained by exogenous variables.

3.7 Findings

The quantitative analysis suggests that employability as perceived by farmers after affiliation into the agricultural assistance program influences satisfaction, continuance commitment, and word of mouth. It indicates SAVP can generate employability. Such a policy program should focus to create new employment opportunities so that the beneficiaries will be satisfied with the program and hence the program gets positive word of mouth from people. The public will spread positive messages about such policy projects which helps better designing of developmental programs. This study has a finding supporting that the main objective of economic development programs should be employment generation (Behera, 2019; Hatzizisis et al., 2019; Serra & Davidson, 2021).

The present study examined that the support services provided by the intermediaries/government are not able to produce satisfaction. This finding is a very important explanation in explaining the status of support services that are not sufficient for beneficiary farmers of affiliated agricultural programs. Public participation is not significant to influence the satisfaction of the beneficiaries in SAVP. The literature suggests that support services, aftersales sales services, and ancillaries are strong predictors of project success (Durugbo, 2020; Shahrouzifard & Faraji, 2016). The present study examines that support services design and mechanism of public participation are not satisfactory. It suggests that the program designers should rethink the modality and operations of support services and public participation in affiliated programs.

4. Triangulation

The first study was based on a qualitative approach and the second study was based on a quantitative approach. The qualitative study indicated the lack of training, skill-building sessions, and support mechanisms for farmers.

A quantitative study also came up with a similar finding that the support services and public participation variables are not significant to generate satisfaction in farmers. Support services include technical training, skill-building sessions, knowledge-sharing workshops, and technical ability-enhancing assistance. But the result suggests that such a support service mechanism is either absent or has an insignificant influence on farmers' satisfaction despite its presence in program delivery. Public participation is insignificant in influencing the satisfaction of the farmers. Public participation is not influential to farmers' satisfaction.

Triangulation uses widely accepted norms to check the facts from various perspectives to test the truth of the phenomenon (An Introduction to Triangulation, n.d.; John W. Creswell, 2009). Subsidy in the agricultural program by direct cash transfer in Smart Agricultural Village Program (SAVP) is a case study taken to retrospect from two perspectives- one explorative and the next hypothesis testing using a conceptual model, both based on positivistic ontology and epistemology. Similarly, the finding discusses the results of both studies; the conclusion draws a single outcome from both studies that subsidized agricultural programs should be conceptualized and designed as service products by the concerned authority; then policy implications are discussed accordingly and directions for future research are explained at the end.

Both studies converge on similar findings. The studies show support services and public participation constructs cannot influence farmers' satisfaction. After-sales services and loyalty programs are major components in value creation and need fulfillment of consumers, but the SAVP programs lack the effect of both components in the program, although the program has been successful in creating perceived employability. Both studies give a single direction that strong service support mechanisms are necessary for the government's developmental programs. Policymakers should come up with new concepts in such sectors. The traditional concept of treating the agricultural sector as a manufacturing sector should be redefined. Service concepts and orientation should be inserted in such programs (Behera, 2019). If such insertions are already there, then such insertions are in shortage. Additional service components should be added to enhance the value of such government products (Botsiou et al., 2018).

5. Conclusions

The service component is essential in developmental programs. Merely subsidies or cash transfers cannot achieve the desired goal. The conceptualization of such programs should be updated or validated as the business environment changes. The dynamic change in environmental factors influences all sectors/business areas, and aid-supported agricultural programs or government products cannot remain unaffected by such environmental change.

6. Implications and Directions for future research

The provincial government implemented the SAVP with the objectives of creating jobs in the agricultural sector, improving the living standards of people, and establishing sustainable agricultural practices. The study helped to analyze the developmental programs with a mixed-method approach. A mixed-method approach can be better to evaluate developmental programs

in developing countries. Experts in the development sector can use the mixed-method approach to evaluate such programs.

Government officials, supply-side stakeholders, agricultural experts, and local agricultural technicians can understand the shortcomings of such programs and can plan to execute them with remedy tools in hand to minimize the probable shortcomings.

Local managers, farmers' group coordinators, and partners in the agricultural value chain can sort out local-level problems if they are aware of the findings of this study. These parties can help in smoothing uninterrupted operation and execution of such developmental programs by providing positive feedback to farmers. Local managers and partners are the direct stakeholders who remain in touch with the day-to-day operation of agricultural activities.

Although the agricultural sector is treated as a manufacturing sector, present research explores that this conceptualization is not valid anymore, especially in developing countries. Government-aided agricultural programs are not manufacturing in nature, rather they should be conceptualized as service products. The service concept is suitable to define government-aided agricultural programs. This exploration shows new avenues of research to further investigate the nature of such government-aided developmental programs. Further investigation will give a new paradigm to look at developmental programs so that the policymakers and stakeholders will be facilitated in adding better design components for proper implementation and desirable outcomes.

Academicians and policy evaluators will benefit from re-examining the tests applied in this research or can further widen the knowledge horizons of such evaluative and impact studies.

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