



A STUDY TO ACCESS FACTORS AFFECTING AGRIPRENEURSHIP IN DIVERSIFIED UTILIZATION OF POTATO CROP IN STATE OF PUNJAB AND HIMACHAL PRADESH

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Abstract

Growth of any nation depends upon proper and optimal utilization of different resources of nation. Farmers also play very important role for development of nation but mostly dependent on third part for getting right value of crop. The objective of this study is to assess potential of community entrepreneurship opportunities related to diversified utilization and marketing of potato crop to empower farmers and make farmers self-dependent to compete in local and global business environment. The purpose of this research is to find factors influencing entrepreneurship ability of farmers. The study was conducted using data collected by mixed method of semi structured interview and structured questionnaire from farmers practicing cultivation of Kufri Chipsona and kufri alankar potato crop from Jalandhar (Punjab) and Una (Himachal) districts in form of total production, price fetched for crop, cost of production, labor involved. Also comprehensive farm level study had been conducted on production techniques, production pattern, and storage and distribution system of crop produced in year 2017. Data was analyzed using factor analysis. The outcomes exhibited different factors to evaluate and solve operations of community enterprise. The major Issues which need future attention are diversified utilization model integrated with marketing models and efficiency based production model like data envelopment analysis to decide benchmark price of crop. Another very important finding was that rural women also play very crucial role in agriculture production as agribusiness not involves production but processing, preservation and packaging where women have very important role to play.

Keywords: *Agripreneurship, Diversified utilization, Data envelopment analysis, Community entrepreneurship*

Introduction

Potato is one of the most crucial food crop of entire world. There are 9 major potato producing states in India *i.e.* Punjab, Andhra Pradesh, west Bengal, Gujrat, Uttar Pradesh, Haryana and Assam, Bihar, Madhya Pradesh. The production of potato seed crop was 3.5% higher in 2016-17 as compared to 2015-2016, however as compared to last five years potato production was 10.9% higher. Potatoes occupy important place in Indian Cuisine and it is one of the most demanding item of Indian cuisine. Potatoes are also contributing majorly to food security of nation in addition to cereals. In 2017 potato crop occupy area of 2.13 million hectares in India which contributes to total annual production of 44 million tons (Directorate of economics statistics 2018). With projected population

of India expected to increase by 19 percent in 2050 there will very big challenge to increase production of all crops including potatoes. Potatoes crop production depend upon many factors including climate change. After production it is very important for farmers to store crop in cold storage and then distribute it in market. Farmers producing potato crop in India are facing challenge in each process from production to distribution of crop and still not getting right price for their crop which ultimately resulted in Farm stress and tension among farmer and family (Sachdev and Mahna, 2014). Another major challenges faced by farmers are disease affecting crop during or before cultivation, drought condition, high cost of labor and pesticides involved in process.

If look at other side of coin Storage and procurement

facility provide by Govt. for storing potatoes and purchasing crop are not adequate or considers as null as compared to yield of potatoes. According to farmers of Punjab and lower Himachal for finished 1 kg potato it cost them Rs 7 and what they are getting is Rs 2.5 kg as value for it, retailers however selling potato to consumers at Rs. 20 to 30 Kg (ISAAA, 2017). Sources even said many farmers plough back potatoes in their filed many dump alongside road many are using it as fodder to cattle, Increasing Transportation cost because of increasing prices of diesel add again to problems of potato growing farmers. How long farmers keep on depending on third party for getting right value of crop (Singh and Pandey, 2012; Sharma, 2013). If we look at total production of potatoes in India state wise which is shown in table 1 despite of many challenges faced by farmers is very high, Definitely farmers require some other mechanism or innovation model consisting of mix of marketing and diversified utilization to crop to empower themselves and all parties involved in that process of procurement and storage and production. Marketing strategy of potato crop can be done in similar fashion as done for green products from last 4 to 5 years as promote potato green products also as to maintain good health is most important consideration for green FMCG products followed by environment consciousness (M. farhan, 2017).

Diversified Utilization and Marketing of potato crop

After looking at data of table 1.1 it is very important to properly utilize such large amount of produced crop to its fullest potential. With the advent of technology new and advanced varieties are available in market like chipsona potato and kufri alankar potato these varieties require less amount of water and are resistant to climate change and disease. Because of changing lifestyle, demand of ready to eat food is increasing, demand of potato based ready to eat food like French fries, Potato based smileys and snacks are also increasing (Waseem khan and M. Farhan 2017). According news published in economics times market of French fries are increasing 30% annually and expected to grow even faster that is why Canada based McCain which is selling one out of three French fires packets are doing so big in India, Only 5% of Indian household and 20% of food service operators are currently buying frozen French fries so there is huge potential of increase in sales, the Canadian company which is having largest market share in India and is supplying to Kentucky fried chicken and McDonald is setting up its third line of frozen processed foods in Gujarat. The business is lucrative for everybody involved except farmers which sell potatoes at Rs 7-8/Kg and finally Food chains after processing selling at Rs 300-

600 per kg after processing. In following tables data shows revenue in potato chips segment in India from 2002 to 2019 and which is expected to increase by USD 536m by 2023.

Efficient marketing model is required for selling crop in market to fetch right value of crop even farmers are also practicing small scale storage models utilizing Solar panels on roof top to store potato crop produced from their farms which will reduce pressure on farmers to store crop in cold storage which will further increase input cost (Fares and El-Sayed, 1998; Velimirov *et al.*, 2008). Innovative model is required for production to storing preservation and packaging of crop family members must be involved in business including women of family who can contribute directly or indirectly to agribusiness. (Munkvold and Hellmich 1999).

If we look at potato production in India which is very high as mentioned in table 1.1 and demand of processed potato products is also increasing so there is gap that farmers are not getting right value of crop is absence of strong marketing model aligned with production and storage of crop to bring crop in market in such a way farmers producing potatoes should work in to involve community or family members to make potato semi processed for french fries or evening snacks (aloo bhujia) like converting potatoes into raw finger fries and then storing it which will fetch better price for crop before selling it to final consumer. Potato can likewise be processed into an assortment of items running from Potato

Table 1: Top 20 potato producing states production and productivity data (2017).

Sl.No	States	Area (Hectare)	Production (Tonnes)	Productivity (Kg/Hect.)
1.	TamilNadu	1845.5	6024.0	3113
2.	Kerala	234.0	625.1	2636
3.	Karnataka	1487.0	3512.0	2391
4.	AndhraPradesh	3441.0	10514.0	3056
5.	Assam	2495.8	3796.7	1576
6.	Bihar	3213.7	3620.7	1138
7.	Chhattisgarh	3670.0	4110.4	1120
8.	Gujarat	679.0	1292.0	1870
9.	Haryana	1205.0	3625.0	3008
10.	HimachalPradesh	76.7	105.2	1385
11.	Jammu & Kashmir	259.9	497.4	1914
12.	Jharkhand	995.0	1491.0	1505
13.	MadhyaPradesh	1470.0	1260.6	872
14.	Maharashtra	1470.0	2212.0	1526
15.	Orissa	4365.1	6895.0	1580
16.	Punjab	2802.0	11236.0	4010
17.	Rajasthan	150.7	228.3	1515
18.	UttarPradesh	5186.7	10792.1	2082
19.	Uttarakhand	294.0	614.0	2088
20.	West Bengal	5630.1	14881.7	2611
	Total	40971.2	87333.2	40996

Source: State deprment of hospitulutr and agriculutre

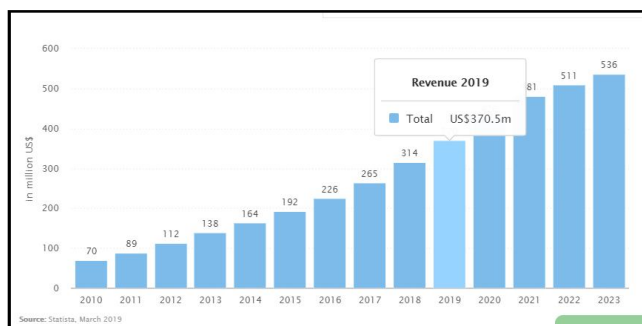


Fig. 1: Revenue in the Potato Chips segment amounts to US\$370m in 2019.

powder, Potato starch, and solidified Potato chips, Potato safeguarded in vinegar granules, child nourishment and liquor. Development of processing industry is also good to reduce difficulty of overabundance and the ensuing trouble of putting away extensive amounts of Potatoes amid times of amazingly high temperatures. With the developing acknowledgment that processed Potatoes bring impressive higher returns than fresh Potatoes, processing activity is probably going to turn upward strongly in the coming years. (Vazquez-Padron *et al.*, 2000; Pasini *et al.*, 2002). There is extensive degree for expansion of this industry in India but significant production of crop is accompanied with serious marketing problems in India. Hossain *et al.*, (2004) gives practicing community entrepreneurship using raw crop to convert it into semi processed ready to eat item is one sustainable solution for farmers to empower their family economic condition in long run, Sole dependency only on third party is traditional method of farming, involving community will reduce input costs which further can bring better satiability for business.

Materials and Methods

Research design for Comparison of agripreneurs and traditional farmers for Community involvement.

The primary research of the investigation is to prescribe ways how factors of the social, monetary, political, social system can be changed so as to encourage the reception of enterprising abilities by the farmers. This paper is divided into two stage analysis first stage is find comparison of agripreneurs and traditional farmers in terms of market orientation, technology adoption, community involvement and crop diversification and second stage analysis indicates factors affecting farm entrepreneurship. The study was conducted using data collected by mixed method of semi structured interview and structured questionnaire from 309 farmers practicing cultivation of Kufri Chipsona and kufri alankar potato crop from Jalandhar (Punjab) and Una (Himachal) districts in form

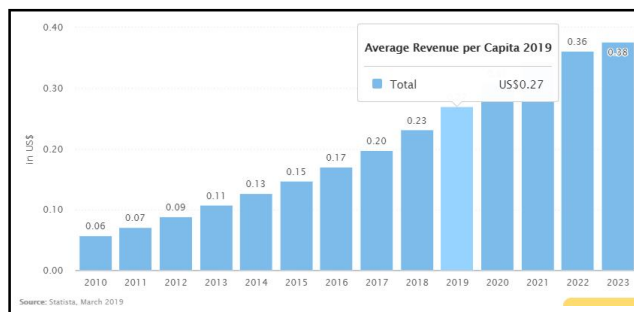


Fig. 2: The average revenue per person in the market for Potato Chips amounts to US\$0.3 in 2019.

of total production, price fetched for crop, cost of production, labor involved and extensive farm level study has been done to evaluate results. With time farmers, horticultural representatives, specialists and government have understood the requirement for increasingly enterprising tendency in the farming business. The advancement of pioneering aptitudes of farmers is a huge issue, which should be advanced by every one of the partners in the rural system Akram Khan, Md. Abdus Salam Mohd. Farhan, 2017. The investigation of social and financial condition of cultivating ought not be disparaged while advancing the improvement of the enterprising aptitudes, as business is the arrangement of innovation. (Bengt Johannisson, 1990) explains the very role of the community entrepreneur is to bridge these different settings through alert leadership, if required organized as a team'.

This paper plans to address explicitly the issue of entrepreneurship among farmers in Punjab and Himachal Pradesh in India for potato crop. The present investigation depends on the farm level information gathered from 309 sample families representing various class and asset base in two differentiating agro climatic locales of states. In the present examination, the total income of a farmer from for every one of the exercises (counting crops, animals, pay and exchange, and so forth.) has been considered as the pointer of a fruitful business entrepreneur. Higher overall gain of a farmer shows the larger amount of business enterprise.

Farmers were isolated into two gatherings in particular, (1) Traditional or Customary Farmers and (2) Agripreneurs. Customary farmers comprises of 229 farmers, who were all the while developing customary harvests and rehearsing old homestead rehearses while Agripreneurs comprises of 80 farmers, who received new advances and homestead rehearses. These are the farmers who win attractive total compensation from different endeavors and have broadened their network for higher total compensation. They are rehearsing

Table 2: Mean assessment of personality.

Personality Characteristics	Agripneurs	Traditional farmers
Market seeking	3.4	1.1
Target oriented	3.8	1.2
Innovative	4.1	0.6
Directive	2.6	0.02
Determination	3.7	1.3
Workability	3.2	1.4
Capability	3.8	0.9
Motivated	3.4	1.6

numerous creative advancements and are trendsetter for different farmers to utilize new advances furthermore, improved ranch rehearses. Also comprehensive farm level study had been conducted on production techniques, production pattern, and storage and distribution system of crop produced in year 2017. Based on data collected various comparison have been done on personal qualities of traditional farmers and agripneurs practicing cultivation of potato crop if we look at market orientation, creativity cores of traditional farmers are less a as compared to agripneurs. As has been referenced before those individual characteristics of the farmers generously influence the agribusiness, an endeavour was made to measure contrasts in a couple of the individual characteristics of both the kinds of farmers.

Results and Discussion

The results in table 2 demonstrates that agripneurs had higher scores for practically all the individual qualities, for example, inventiveness, administration, constancy and activity and a low score for detached and lethargy than conventional farmers. Farmers with higher scores for detachment are less development arranged and then some (monetarily) traditionalist. All in all, agripneurs were more market-arranged and accomplishment situated. Furthermore, they were more enlivened through introduction visits and prepared to step up to the plate for reception of new advancements and homestead rehearses. They were additionally progressively adaptable to acknowledge the progressions yet imaginative in considering.

Statistic characterization of Agripneurs and

Table 3: Statistic characterization of Traditional Farmers and Agripneurs.

	Agripneurs farmers	Traditional farmers farmers)
Number of family members	7	6
No. of women involved directly and indirectly In farming.	3.3	1.6
Earning members (Number)	3	2
Age of head of family	47	54
Percentage of head having more than 10+2 education.	15	10

Traditional Farmer and role of women in agripneurship

Demographic profile of farmers leads to involvement of community in agrpnurship if you look at Proportion of Illiterate heads of family it is almost 60 percent in traditional farmers which need to be converted into suitable work force for preservation and packaging of potato crop Profile of the agripneurs and customary farmers show that, by and large, agripneurs had generally bigger size of family however less number of acquiring individuals contrasted with customary farmers. The leaders of the group of agripneurs were moderately more instructed than their partners. In addition, both the classes of farmers were not old and there was no sharp distinction in the age of the head of group of agripneurs and conventional farmers. It was normal that age as an intermediary of experience would assume a critical job in enterprise however it appears that it was not discovered imperative as both the gathering of farmers had pretty much comparative age/understanding. According to data no. of women involved directly and indirectly in farming are on an average 3 in case of agripneurs and only 1 case of traditional farmers. Women are involved in indirect activities of preservation and packaging of potato crop which will reduce pressure of input cost to agripneurs not only women they can involve other community members in business.

Crop pattern for diversification and adoption of new technology.

It is obvious from table 3.3 that agripneurs had increasingly differentiated editing framework while the customary farmers focused more on oat based cropping

Table 4: Crop growing pattern.

Crops	Proportion of total cropped area (%)	
	Modern farmers	Customary Farmers
Standard crops of cereals	34.6	63.6
Pulses crops	8.5	10.6
Crop of oil	15.3	6.8
Crop Sugarcane	9.9	3.4
Flower crops	7.3	0.5
Potato	7.1	3.2

framework. Also, expanded trimming arrangement of agriprenurship was increasingly committed to high esteem crops. Agriprenurship committed as it were 35.5 percent of their trimmed territory for grains against 63.3 percent by customary farmers. Notwithstanding, there was little distinction in the region gave to beats by both the gatherings of farmers. In any case, on the off chance that we contrast the territory committed with other high esteem crops like therapeutic and fragrant plants, sugarcane and agricultural yields like foods grown from the ground, and oilseeds, and so on agriprenurship had significantly dedicated more regions to these harvests contrasted with customary farmers.

The basic analysis of agriprenurship and customary farmers in Punjab and Himachal Pradesh unmistakably shows that if the correct condition is made and farmers are given sufficient framework support, rural creation to guarantee sustenance security can be expanded and numerous farmers can improve their salary what’s more,

Table 5: Adoption of modern technology.

Modern Technology	Modern farmers	Customary Farmers
Testing of Soil	42	14
Treatment of Seeds	21	3
Organic fertilizer	32	15
Green fertilizer	21	-
Hybrid variety of crop	62	11
Hybrid Mixtures	11	6
Creating Green Fodder	16	2

Table 6: Reliability matrix and factor loading.

Construct	Item			CA(α)	Factor Loading
		Mean	SD		
ATFE	b1	3.85	1.14	0.90	0.88
	b2	3.52	1.28		0.86
FEQG	b3	2.67	1.28	0.74	0.83
	b4	3.33	1.13		0.96
EC	b5	3.84	1.16	0.80	0.76
	b6	3.85	1.07		0.84
	b7	3.89	1.09		0.73
EKC	b8	3.15	1.21	0.89	0.71
	b9	3.13	1.18		0.91
	b10	2.89	1.26		0.84
SCC	b16	3.25	1.14	0.84	0.85
	b17	3.26	1.13		0.82
	b18	3.48	1.08		0.89
RP	b12	3.28	1.08	0.83	0.73
	b13	3.19	1.05		0.79
	b15	3.60	0.98		0.85
	b19	3.71	1.07		0.70

Note: ATFE = attitude towards farmer entrepreneurship growth; FEQG = farmer entrepreneurship qualitative growth; EC = economic capabilities; EKC = educational and knowledge capabilities; SCC = socio-cultural capabilities; RP = rural poverty; SD = standard deviation; CA = Cronbach’s alpha (α). N = 309.

personal satisfaction through reception of new innovations and improved farm practices. In opposition to normal conviction, standing farm size, and age of the farmers are not really significant limitations for the advancement of agriprenurship. Indeed, even less instructed little farmers of maturity can likewise turn into an agri-business visionary gave they are educated about the correct kind of advancements and learning about their utilization.

Research design for assessing potential for agriprenurship among potato growing farmers

This paper plans to address explicitly the issue of entrepreneurship among farmers in Punjab and Himachal Pradesh in India for potato crop. The present investigation depends on the farm level information gathered from 309 sample families representing various class and asset base in two differentiating agro climatic locales of states practicing cultivation of potato crop. While using structural equation modeling a higher sample size is preferred but it has been found that minimum 309 sample size can be accepted in SEM analysis using AMOS Software, Hence using multistage sampling techniques data from 309

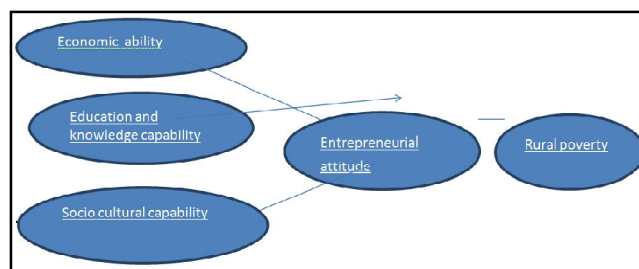


Fig. 3. Conceptual framework

farmers practicing cultivation of kufri chipsona and kufri alankar potato crop from Jalandhar and Una district of Punjab and Himachal Pradesh.

The reason for the conceptual framework is to help the researcher to rapidly observe the proposed relationship and thus its utilization in this examination. An investigation by Shorsh and Vernon (2007), consider conceptual framework derived from a theoretical system is important to carry out basic task in research work. Research framework for present study consider variable as Economic ability, Education knowledge and socio cultural capability factors as independent variables and entrepreneurship behavior and rural poverty as dependent variables and CFA model is applied to find out relation between independent and dependent variables.

Measurement model

For assessing the reliability of used constructs in framework cronbach alpha value is tested and from finding, The value of cronbach alpha come out to be more than traditionally accepted value of 70. Measuring reliability is very important to check whether constructs are suitable for research considering all items equal. Reliability is degree which is an assessment whether assessment tool used for research produces stable and consistent results and in this case reliability cronbach alpha values for all constructs are suitable to be consider for research and constructs consider for research maintain internal consistency. Cronbach alpha value is consider as function of total number of items available for research and average inter correlation among items the present

values of alpha shown in table below indicate the consistency of constructs for study.

Measurement model and path model for assessing potential for Agripneurship

To measure convergent validity and common medium variance of all constructs average variance extracted. Fitness of model is examined using measurement model mentioned in below table.

As minimum value required is 0.5 and according to table all constructs are having value greater than 0.5. To measure internal consistency composite reliability is used which is having value ranged from .73 to .91 which is higher than standard value of .7. Other values of fit indices are as $\chi^2/DF = 3.1$, $gfi = 0.9$, $agfi = 0.8$, $rmsea = 0.05$, $cfi = 0.93$ and $NFI = 0.91$ for first two constructs of education and knowledge and for farmer agripneurship ability and for qualitative inclination of farmers the fit values are $\chi^2/DF = 3.63$, $GFI = 0.93$, $AGFI = 0.84$, $RMSEA = 0.03$, $CFI = 0.89$ and $NFI = 0.94$ and constructs of poverty of rural people $\chi^2/df = 3.84$, $gfi = 0.87$, $agfi = 0.81$, $rmsea = 0.04$, $cfi = 0.88$ and $nfi = 0$.

It can be examined from above path model that economic properties ($\chi^2 = -0.46$) negatively affect entrepreneurship ability of farmer although it is still significant and socio cultural properties positively effect on entrepreneurship ability of farmer and qualitative growth of farmer ($\chi^2 = 0.38$). This path model analysis show that economic and education are important for developing entrepreneurship ability of farmer but socio cultural properties bend to have greater effect on the

Table 7: Measurement matrix

Item	Construct	S.E.	p-value	CR	AVE	χ^2/df	GFI	AGFI	RMSEA	CFI	NFI
y5	←EC	0.20	0.000***	0.81	0.69	3.41	0.84	0.73	0.04	0.83	0.87
y6	←EC	0.20	0.000***								
y7	←EC	0.20	0.000***								
y8	←EKC	0.35	0.000***	0.89	0.72	3.74	0.92	0.85	0.05	0.93	0.91
y9	←EKC	0.35	0.000***								
y10	←EKC	0.35	0.000***								
y16	←SCC	0.28	0.000***	0.85	0.66	3.64	0.88	0.71	0.05	0.85	0.82
y17	←SCC	0.28	0.000***								
y18	←SCC	0.28	0.000***								
y1	←ATFE	0.39	0.000***	0.73	0.83	3.65	0.93	0.84	0.03	0.89	0.94
y2	←ATFE	0.39	0.000***								
y3	←FEQG	0.23	0.000***								
y4	←FEQG	0.23	0.000***	0.84	0.68	3.57	0.75	0.89	0.05	0.76	0.91
y12	←RP	0.34	0.000***								
y13	←RP	0.34	0.000***								
y15	←RP	0.41	0.000***	0.84	0.58	3.84	0.87	0.81	0.04	0.88	0.90
y19	←RP	0.46	0.000***								

Cut-off Criteria: CR ≥0.07; AVE>0.05; $\chi^2/df<5$; GFI>0.90; AGFI>0.90; RMSEA<0.08; CFI >0.90; NFI>0.90; CA≥0.5. Note:
 *p<0.05;
 **p<0.01;
 ***p<0.001.

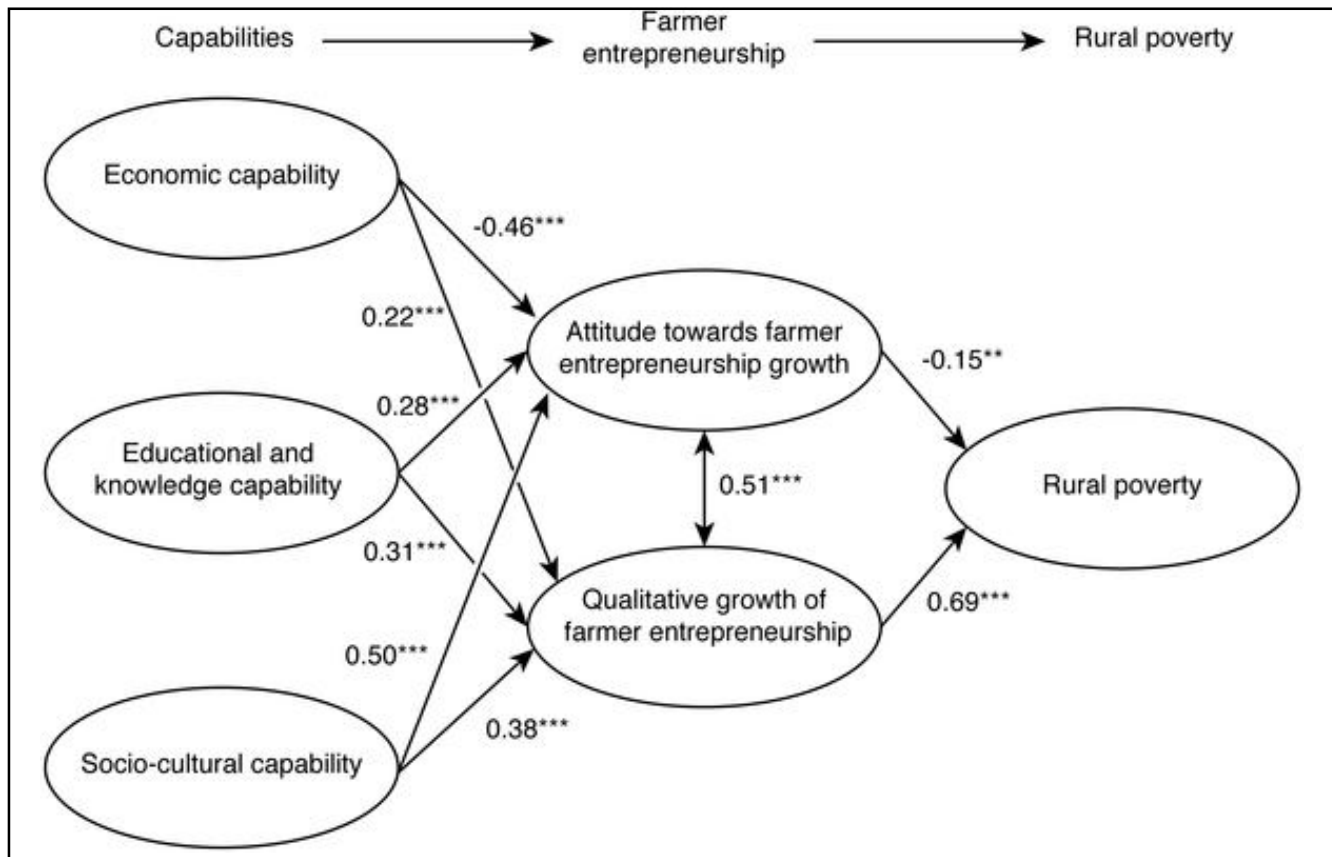


Fig. 4. Path model of constructs

growth of agripneurship ability of farmers and it is very important to analyze effect of entrepreneurship of rural poverty and from path model analysis is being done that qualitative growth of farmer entrepreneurship has positive effect and attitude toward entrepreneurship has negative effect on alleviation of economic condition. This implies that in order to enhance poverty or economic condition of farmer it is very important to understand need to promote the qualitative growth of farmer entrepreneurship toward understanding different diversification utilization pattern of potato crop.

Results from path model discussed above give suitable inputs for assessing potential of farmers cultivating potato crop to convert them into entrepreneurs to become self-sufficient for themselves and for their families. For converting farmers to agripneurs economic capability, Educational knowledge and socio cultural capability play very important role but out of all most important is socio cultural capability of farmers. To promote entrepreneurship ability among farmers Govt. need to develop and promote culture while opening incubation and research centers for practicing research and to bring innovation in diversified utilization of crop but also in to bring innovation in processing preservation and packaging. Some farmers develop their specialization

only in preservation and packaging which can act as raw material for others also. Further govt. can use technique of data envelopment analysis to decide benchmark price for crop. DEA is Input/Output approach which uses linear regression model to decide about what input is required to produce number of outputs and it also gives farmers and govt. idea about how much input need to be given for proper output. Value can judged on three types of scales which are less constant return to scale, variable return to scale and diminishing return to scale.

Conclusion

This study is done to asses' potential of farmers to become entrepreneurs in field of potato production, processing and marketing and also to involve community as stakeholder in agribusiness. Using a sample size of 309 farmer's data taken from Jalandhar and Una districts of Punjab and Himachal Pradesh this research paper employed techniques to differentiate qualities of agripneurs and traditional farmers in terms of diversification of crops, market orientation and technology adoption a. In second stage conceptual framework is tested using for three properties of farmers which are economic, education and socio cultural ability using Amos 21 alongside Spss to asses potential to become

entrepreneurs. The study indicates that socio cultural ability has greatest effect toward farm entrepreneurship growth as well as qualitative growth of farmer, economic ability and education has least effect in qualitative growth of farmers. The Qualitative growth of farm entrepreneurship has positive and very significant effect on farm entrepreneurship. However attitude toward entrepreneurship has negative effect on rural poverty. A comparative study done of agrpreneurs and traditional farmers indicate that agrpreneurs are more market oriented and adaptive to new technology. If results of this research are taken as whole the main policy implication can come out of this is Govt off India and state Govt. in an attempt to remove rural poverty and empower farmer growing potato crop should put more stress on framing policies of promotion and education of farm entrepreneurship in rural areas.

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