

POLICY ISSUES – CREDIT, INFRASTRUCTURE SUPPORT, RISK MANAGEMENT AND MARKETING FOR DOUBLING FARMERS INCOME - A FOCUS ON APMC

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ABSTRACT

As we all know the success of Indian agriculture is not based on our traditional farming system and cultivation practices. Since 1947 Indian agriculture has changed tremendously in terms of a type of farming, cultivation practices. Also, Indian agriculture has achieved a drastic increase in productivity, quality and in terms of varieties. This all has achieved because of different policies implemented by the Indian government with a different state government in collaboration with the Indian Council of agricultural research and state agricultural universities. In spite of this huge change in the agriculture sector, we are facing an increase in demand for agricultural and allied products year by year, Because of this increasing population and awareness for quality products and agricultural output. Still, we need to implement modern technologies in the primary agricultural sector as well as the secondary sector. This can be achieved through the effective implementation of different policies at the base level to increase productivity. These policies can be technology, fertilizer policy, irrigation policies, electricity policy, marketing policies, financing policy, subsidies for all types of inputs etc.

KEY WORDS : Agricultural Policies, Marketing Institutions, Doubling Farmers Income, Reliability, Validity

INTRODUCTION

Sustainability is a normative concept should be obvious. It embodies a particular moral attitude to the future, expressing how much we care for and is willing to make sacrifices for our descendants and how, and to what degree, non-humans figure in this process. Mankind is considered the superior to the living things in the world. Civilization transformed that into producer of food and other basic requirements from the nomadic behavior in which hunting and snatching were the way of life. Land cultivation and food production marked the beginning of civilization particularly in the riparian lands. Mother Nature has to offer her blessings to satisfy the food needs of all living creatures. The critical issues that Indian agriculture is facing at present are the knowledge deficit and infrastructure deficit. Major problems are related to irrigation infrastructure, electricity infrastructure, market infrastructure, processing infrastructure, credit policies and transport infrastructure add significant cost to farmers' at field level. Another issue we are facing is proper extension system which plays significant role in delivering proper knowledge about farm operations, technologies, different government policies etc. at ground level. To conquer these issues Indian government has initiated different programmes through KVK, Panchayat Samities, NGO'S, and joint prorammes by government and private institutes. Government failure is a major concern in agriculture because of high risk involved in the agriculture sector because of uncertainty of climate, pest and disease attack, high and low pick arrivals, and demand uncertainty at domestic as well as international level. Also the demands of agricultural raw material for different processing industries contribute a smaller high and low pick uncertainty. Like any other business enterprise, agriculture is subjected to high risks because of the volatile nature of the factors involved. Usually farmers have droughts in one year and heavy rains in the next. In both cases, farmers lose out, hence

they have to look for a normal period to make money. Government, therefore, has to play a major role in providing support to farmers. This is true all over the world and there is hardly any country where government intervention is not present. There may of course be variations in the extent of intervention. In most of the European countries, American nations and other developed countries of Asia they intervene in agricultural system for the wellbeing of farming community.

LITERATURE REVIEW

A recent FAO study (2008) found that, whereas wheat prices in Chile closely followed international prices over 2003–2008, in Argentina there was a substantial gap between domestic and international prices which was augmented over the years. Aksoy and Ng, 2010 stated that, trade flows have grown more than twice as fast as aggregate GDP over the past 30 years. The developing world's share of global trade increased from about one quarter to more than one third, and the composition of its exports has been upgraded. For a long time, developing countries exported primary commodities and imported manufactured goods, but over the past two decades they have moved strongly into manufactured exports. Anderson and Feder (2007) suggest that the impact of extension services has been mixed, with some projects having high returns to investment and others only negligible success. A general problem with the T&V approach is that extension agents—who are civil servants—often lack accountability. Anderson and Feder (2007) and Alex et al. (2002)—the decentralization of the system, putting farmer groups or the private sector in charge of service provision, has been the response proposed to overcome these accountability problems. Farmer groups can in fact engage on both sides of the market for extension services. Baffes and Gardner (2003), investigating eight developing countries, conclude that international price volatility does not explain a major part of domestic price instability. In only three of the eight countries, price transmission is significant and domestic price volatility follows international price movements. Byerlee et al., 2010 stated that, the introduction of ICT is also closely related to the issue of learning and can facilitate and enhance the distribution of important information. Croppenstedt et al. (2003) find that credit constraints in Ethiopia severely restrict fertilizer adoption by farmers. Farmers' lack of collateral may be the cause of their restricted access to loans. Property rights for land may therefore be an important determinant of adoption. Also, property rights are important for farmers' incentives to plant new varieties. Coase, 1992 argued that, there are strong theoretical arguments explaining the existence of firms and of bilateral contracts, and these may also be applied to defend support for non-competitive contractual relations in the early stages of agricultural development. Dawe (2008) estimates the transmission of world cereal prices to seven Asian countries. He finds that one-third of real international price increases have been passed to domestic markets. Dorward et al., 1998 argue that 'interlocking transactions' are a widespread contractual form that addresses some of the transaction cost problems of input credit, but that there may be incompatibilities between interlocking arrangements and competitive input and output markets. Dorward et al., 1998, Kydd et al., 2001b stated that, another 'new institutional' view argues that one important reason for states' often half hearted commitment to liberalization, particularly in food crop markets, is their recognition that pervasive market failures prevent the private sector from delivering the necessary services, and policy makers' consequently continue to attempt to intervene to remedy these failures. Fan et al. 2009 stated that, at the regional level, new institutions have been developed, such as national agricultural research systems (NARS) and the New Partnership for Africa's Development (NEPAD). NEPAD, for example, has set a target of 6 percent agricultural growth in order to encourage public spending in this sector. Nevertheless, only a few African countries have reached that goal, whereas public spending in general has been low (during the past 30 years, 5–7 percent of the total national budget) and has fallen short of equivalent spending in other parts of the world, this is in stark contrast to potential returns to such expenditures. Goyal (2010) finds that an Internet kiosk providing prices as well as a new marketing channel to soy farmers in India increased the share of soy cultivated area, and concludes that improved information leads to higher returns. IEG, 2011 stated that, in some African countries, recent expenditures have been very successful in increasing agricultural productivity: one local currency unit spent on agricultural R&D has increased agricultural productivity by about 12 local currency units in Uganda and Tanzania. For Sub-Saharan Africa in general, the return to agricultural R&D and extension is estimated to be around 35 percent. Kaplinsky, 2000, uses value chain analysis to make a more general argument that for suppliers of goods and services the long run

benefits of globalisation are concentrated in intellectual property rights, knowledge and governance, where barriers to entry allow firms to retain rents in otherwise competitive markets. Kydd et al., 2000 argued that, there are concerns that small farmers are also likely to lose out in cash crop production although there are also potential benefits of developing new varieties more quickly and cheaply to better address poor farmers' problems.

OBSERVATIONS

- To study farmer's opinion about agricultural policies for sustainable development

DISCRIPTIVE INVESTIGATION

A descriptive qualitative study was undertaken to better understand the key dimensions related to agricultural policies i.e. all types of inputs, infrastructure for sustainable agricultural development. For this, personal interviews, comprising open-ended questions with the farmers, were conducted.

METHODOLOGY

100 farmers of Bikaner APMC market surveyed randomly and noted their opinion about APMC. The sample size is calculated on the basis of Bartlett, Kotrlik and Higgins research work (i.e. 80 farmers). Primary data is collected by using questionnaire and secondary data is collected from different websites. Qualitative factors analysed by using statistical tools and techniques i.e. construct validity and reliability tools. For analysis 15 statements were selected based on the agricultural policies for doubling farmer's income

Total agri - allied, fisheries, plantation export - import scenario (Million US \$)			
Sr. N0	Product	Export	Import
1	Agri – Allied include processed	13420.44	12188.54
2	Marine	3467.62	56.70
3	Plantation	-	568.86
Source – Ministry of Commerce and Industry, GOI			

RESULT AND ANALYSIS

A) AGRICULTURAL SCENARIO - SECONDARY DATA ANALYSIS

1. CUMULATIVE AGRICULTURAL AND ALLIED COMMODITY EXPORT – IMPORT

Table No – 1 Above table shows the total agricultural and allied commodities

2. TOTAL PRODUCTION OF AGRICULTURAL AND ALLIED COMMODITIES IN INDIA

Table No – 2 The above table represents the cumulative production of different agricultural commodities,

3. POST HARVEST LOSS PERCENTAGE OF MAJOR AGRICULTURAL COMMODITIES

Sr.No	Articles	Total Loss %	Current Production '000 MT	Total loss ('000 crore)
1	Cereals	4.65 - 5.99	252720	21906.22499
2	Pulses	6.36 - 8.41	22950	4846.475291
3	Oilseeds	3.08 - 9.96	321000	8589.5664
4	Fruits	6.70 - 15.88	92846	19011.399
5	Vegetables	7.32 - 12.44	175194	16037.785

Production of various agricultural and allied produce in India

Particulars	Production (000'MT)	Particulars	Production (In 000'MT)
Total Cereals	252720	Honey	88
Total Pulses	22950	Total plantation	16867
Total Oilseeds	32100	Total spices	7077
Cotton	56253	Livestock products**	
Sugarcane	306720	Milk	155600
Total Fruits	92846	Meat	7020
Total Vegetables	175194	Eggs	82939 Million Numbers
Aromatic	1031	Fish	10790
Total Flowers	2246	**2015-16	

Source – Ministry of Agriculture, Cooperation & Farmer's Welfare, GOI. (2016-17)

6	Plantation and Spices	1.18 - 7.89	23944	9874.0803
7	Livestock Products	0.92 - 10.52	270520	20536.36766
			Total	100801.8863

Source – Central Institute of Post-Harvest Engineering and Technology, GOI

Table No – 3 Above table shows the total post harvest loss percentage of different agricultural articles.

4. MODERN FOOD DISTRIBUTION CHAINS AND MARKETING INSTITUTIONS IN INDIA

Modern food distribution chain i.e. birth of government, private, cooperative retail chains like Big Bazaar, D-Mart, Easy day, Food world, Hyper City, Lulu Hypermarket, Margin Free Market, MARKETING INSTITUTIONS LIKE, E-NAM, DMI, CACP, FCI, JCI, CCI, CWC, SWC, STC, APEDA, MPEDA, NCDC, NAFED, NTGF, NCCF, TCMF, SCMF, PACS, Export Inspection Council, Silk Export Promotion Council, State Agricultural Marketing Boards, Rubber Board, Tea Board, Coffee Board, Spices Board, Coconut Development Board, Tobacco Board, Cardamom Board, Coir Board, National Horticultural Board and NDDDB..

5. SURVEY ANALYSIS – PRIMARY DATA ANALYSIS

DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Data collected was analysed through a series of validated tools and procedures. The critical step involved in the development of a measurement scale is the assessment of the reliability of constructs.

No	Respondents Characteristics	% Respondents	N0	Respondents Characteristics	% Respondents
1.	Age	22	3	Gender	
	Below 30	22		Male	72
	31-40	26	Female	28	
	41-50	12			
	51-60	18	4	Income	
		Upto 300000		16	
2	Qualification			300000-450000	42
	High School	20		451000-600000	24
	Higher Secondary College	40		600000-800000	10
Undergraduate	40	800000 and Above	8		
Source – Primary Data					

Table No – 4, Source – Authors Own The above table describes about demographic characteristics of the respondents.

ASSESSMENT OF RELIABILITY

The reliability of items was assessed by computing the coefficient alpha (Cronbach, 1951), that measures the internal consistency of the items. For a measure to be acceptable, coefficient alpha should be above 0.7 (Nunnally, 1978). In the present study, all alpha coefficients ranged from 0.69 (close to the cut-off value of 0.70) to 0.83, indicating good consistency among the items within each dimension.

EXPLORATORY FACTOR ANALYSIS - KMO AND BARTLETT'S TEST RESULTS

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.815
Bartlett's Test of Sphericity	Approx. Chi-Square	1247.706
	Df	105
	Sig.	.000

Table No – 5
Source –
Authors Own

From the Table 5, it can be seen that KMO value greater than 0.6 is acceptable; Bratlett test results also show that the values are significant and thus acceptable. The items in the respective category were individually subjected to PCA with varimax rotation and Kaiser Normalization Using SPSS 20.0, **KMO > 0.6** Acceptable But It Is **Better** if near to 1 (Kaiser and Rice, 19

RELIABILITY AND CONSTRUCT VALIDITY MEASURES

Table 6 explains reliability of the variables used for determining the agricultural policies shows significant effect on doubling farmer's income. Table 7, Indicates that items in each subscale load on one factor. Explains obtained Eigen values, Cronbach alpha, is concerned with the degree of interrelatedness among a set of items designed to measure a single construct (Netemeyer, Bearden & Sharma, 2003).

ANOVA (Reliability Statistics)						
Table No – 6, Source – Authors Own		Sum of Squares	Df	Mean Square	F	Sig
Between People		1705.429	99	17.227		
Within People	Between Items	259.249	14	18.518	6.838	.000
	Residual	3753.551	1386	2.708		
	Total	4012.800	1400	2.866		
Total		5718.229	1499	3.815		

Construct	Item Label	Eigen Value	Factor Loading	Cronbach Alpha	Variance Explained
A	S1	5.614	0.828	0.823	37.428
	S2	2.937	0.807	0.828	19.580
	S3	2.399	0.868	0.822	15.991
	S4	1.226	0.844	0.824	8.172
B	S5	0.674	0.731	0.835	4.496
	S6N	0.409	0.809	0.841	2.727
	S7	0.363	0.892	0.833	2.423
	S8	0.296	0.697	0.827	1.973
	S9	0.241	0.800	0.831	1.603
C	S13	0.138	0.962	0.847	0.921
	S14	0.081	0.963	0.848	0.538
	S15	0.061	0.938	0.841	0.406
D	S10	0.205	0.928	0.831	1.363
	S11	0.186	0.944	0.829	1.241
	S12	0.171	0.813	0.828	1.137

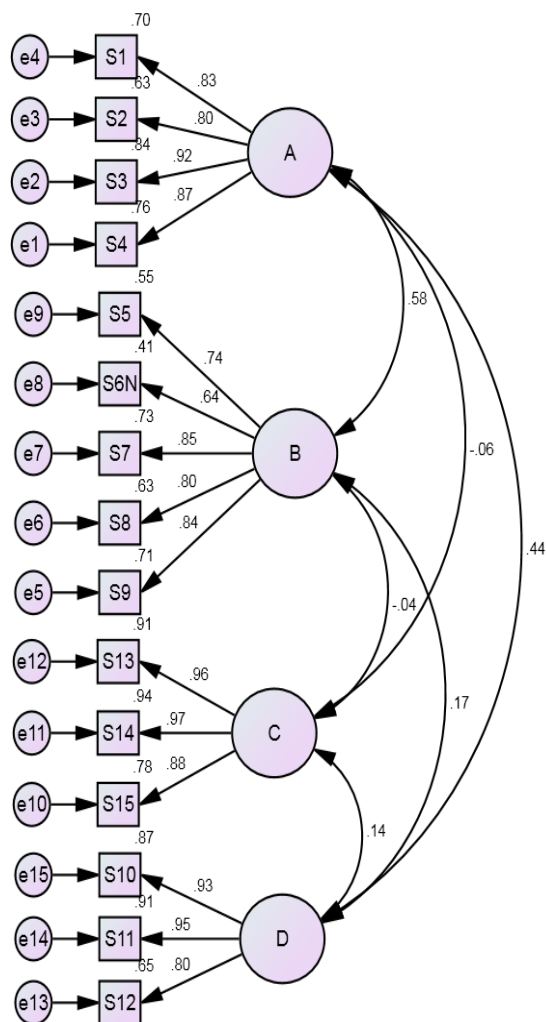
Table No – 7, Source – Authors Own

Before starting tests, first factorial analysis was done; this gave KMO, Eigen values, average variance explained and other measures. Now from TVE table analysis need to correct rotated component matrix, from which sixteenth new variable named S6N was extracted for further analysis, new rotated component matrix generated with 4 highest eigen values. Also all 15 variables were divided into 4 sub categories according to regression loading, and then further calculations for validity analysis done by using different tools; we get the same results i.e. whether model is fit or unfit. There can be fractional changes in some values of the finally accepted model after calculating values by different methods.

SOME OF THE IMPORTANT VALIDITY TESTS GENERALLY CONSIDERED INCLUDES CONTENT, CONSTRUCT, DISCRIMINANT, AND CRITERION RELATED VALIDITY.

CONTENT VALIDITY - The content validity of a construct can be defined as the degree to which the measure spans the domain of the construct's theoretical definition (Rungtusanatham, 1998). **Notes: Factor loadings** greater than 0.5 is acceptable (Hair et al. 1995). **Alpha** values of 70% or higher are considered acceptable (Nunnally, 1978). **KMO** static value above 0.6 being acceptable (Kim and Mueller, 1978). **Item** deleted on account of low factor loadings (Hair et al., 1995).

CONSTRUCT VALIDITY - It involves the assessment of the degree to which an operationalization correctly measures its targeted variables (O.Leary-Kelly and Vokurka, 1998). According to them, establishing construct validity involves the empirical assessment of unidimensionality, reliability, and validity (convergent and Discriminant validity). In the present study, in order to check for unidimensionality, a measurement model was specified for each construct and CFA was run for all the constructs. Individual items in the model were examined to see how closely they represent the same construct. A comparative fit index (CFI) of 0.70 or above for the model implies that there is a strong evidence of unidimensionality (Byrne, 1994).



The CFI values obtained for all the four constructs in the scale are equal to 0.71 or above as shown in Table 7. This indicates a strong evidence of unidimensionality for the scale. Once unidimensionality and reliability of a scale is established, it is further subjected to validation analysis (Ahire, Golhar and Waller, 1996).

MODEL FIT determines the degree to which the structural model fits the sample data. Result shows the Chi square value (χ^2) of 153.837 with 84 degrees of freedom. The CMIN/DF (minimum discrepancy divided by degrees of freedom) ratio was 1.831, which is within the recommended range of less than 5, which is indicative of an acceptable fit between the hypothetical model and the sample data (Carmines & McIver, 1981). The goodness-of-fit index (GFI) was 0.821 and adjusted goodness-of-fit index (AGFI) was 0.745. The root mean square error of approximation (RMSEA) was 0.092, which falls within the cutoff value of 0.06 (Hu & Bentler, 1999). The Tucker-Lewis Index (TLI) was 0.928 while the Comparative Fit Index (CFI) was 0.943. The Bentler-Bonett normed fit index (NFI) was 0.884 and Bollen's incremental fit index (IFI) was 0.944. The values for fit indices exceed the recommended level of 0.90, suggesting that the hypothesized model represented an adequate fit to the data.

ITEM RELIABILITY, COMPOSITE RELIABILITY AND AVERAGE VARIANCE EXTRACTED (AVE)

Table 8, Item reliability indicates the amount of variance in an item due to the underlying constructs rather than to error (Suh & Han, 2002). The item reliability of individual items can be assessed by squaring their respective standardized factor loadings (Segars, 1997). AMOS result reveals that all the items had R2 values greater than 0.50 excluding S6N, which shows that all variables are significantly related to their specified constructs and thus verifying the positive relationships among indicators and constructs (Hair et al., 1998). Composite reliability is a measure of the internal consistency of the construct indicators, which depicts the degree to which the items indicate the common latent (unobserved) construct (Hair et al., 1998). All constructs had composite reliability above the recommended level of 0.70 (Hair et al., 1998).

AVE measures the amount of variance that is captured by the construct in relation to the amount of variance due to measurement error (Fornell & Larcker, 1981). AVE values greater than 0.50 are considered adequate for any construct (Bagozzi & Yi, 1988; Hair et al., 1998).

MODEL FIT INDICES

PARAMETER ESTIMATES

LATENT VARIABLE	ITEM LABEL	STANDERDISED FACTOR LOADING	CRITICAL RATIO	R ²	AVE	COMPOSITE RELIABILITY
A	S1	0.83	10.207	0.6889	0.732	0.916
	S2	0.80	9.495	0.64		
	S3	0.92	13.273	0.8464		
	S4	0.87	_a	0.7569		
B	S5	0.74	8.356	0.5476	0.606	0.884
	S6N	0.64	6.508	0.4096		
	S7	0.85	9.810	0.7225		
	S8	0.80	9.053	0.64		
	S9	0.84	_a	0.7064		
C	S13	0.96	15.757	0.9216	0.878	0.956
	S14	0.97	16.257	0.9409		
	S15	0.88	_a	0.7744		
D	S10	0.93	11.309	0.8649	0.807	0.926
	S11	0.95	11.607	0.9025		
	S12	0.80	_a	0.64		

_a Indicates a parameter fixed at 1.0 in the measurement model, All Critical Ratios (t-values) are significant at 0.05.

Table No – 8, Source – Authors Own

SCALE VALIDATION

Once the reliability and the structure of the scale are supported, the validity of the instrument has to be assessed.

CONVERGENT VALIDITY

A measure is said to possess convergent validity if independent measures of the same construct converge, or are highly correlated (Netemeyer, Bearden & Sharma, 2003). In the AMOS output file, the t-value is the critical ratio, which represents the parameter estimate divided by its standard error (Netemeyer, Bearden & Sharma, 2003). As can be seen from above table that, all the factor loadings are significant at 0.05 significance level, which supports the convergent validity. According to Fornell & Larcker (1991), convergent validity of the construct is also demonstrated when the average variance extracted is above 0.50.

DISCRIMINANT VALIDITY ANALYSIS

	D	A	B	C
D	0.898			
A	0.440	0.856		
B	0.165	0.579	0.778	
C	0.136	-0.057	-0.041	0.937

Source – Authors Own

Table No - 9

* Based on (Fornell & Larcker, 1981), AVE in the Diagonal and squared correlation off-diagonal.

Discriminant validity refers to the extent to which measures of theoretically unrelated constructs do not correlate highly with one another (Brown, Churchill & Peter, 1993). The Discriminant validity of the measures in the present study was established by comparing the average variances extracted with the squared correlation between two constructs (Fornell & Larcker, 1981).

IMPLICATIONS

The present study makes both academic and practical contributions. From an academic point of view, it contributes to the existing literature on different agricultural policies for doubling farmer's income. The study first provides a theory-based framework for understanding the direct effects of different variables which affects the agricultural income. The newly refined and validated measures can be used by future researchers to study agricultural policies which can affect agricultural income. In this article different agricultural marketing organisations which can be linked with or solely can affects the agril. Produce as well as agril income, like wise other attributes or latent variable like export facility, extension facility, taxation policy, modern marketing chains, transparency, grading and standardization laboratory, credit policies, scientific transportation, agricultural prices forecasting facility, agricultural arrival and demand forecasting facility, means of connectivity, weather forecasting facility and agricultural processing facility has shown a significant impact on farmers income by manipulating acquired data using different statistical tools. The scores obtained like Factor loading, Cronbach's alpha, C.R., AVE, R², Chi-square, CMIN, and P Close has well significant impact on increasing or doubling farmer's income. These all different policies are very much interrelated with each other. This all policies have not included even modern technology of farming then also this all policies has very much correlation with each other to have impact on agricultural income

APPENDIX – MEASURES

S1Agriculture Marketing Organisations, S2Export Facilities, S3 Extension Facility, S4Taxation policy, S5Modern Marketing Chains, S6Transparency, S7Grading and Standardization Laboratory, S8Credit policies, Age, Gender, Income, Qualifications, S9 Scientific Transportation, S10 Agricultural Prices Forecasting facility, S11 Agricultural Produce Arrival Forecasting, S12 Agriculture Produce Demand Forecasting, S13 Means of Connectivity, S14 Weather Forecasting Facility, S15 Agricultural Processing Facility

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