Chapter–6

The Empirical Results and Revelation

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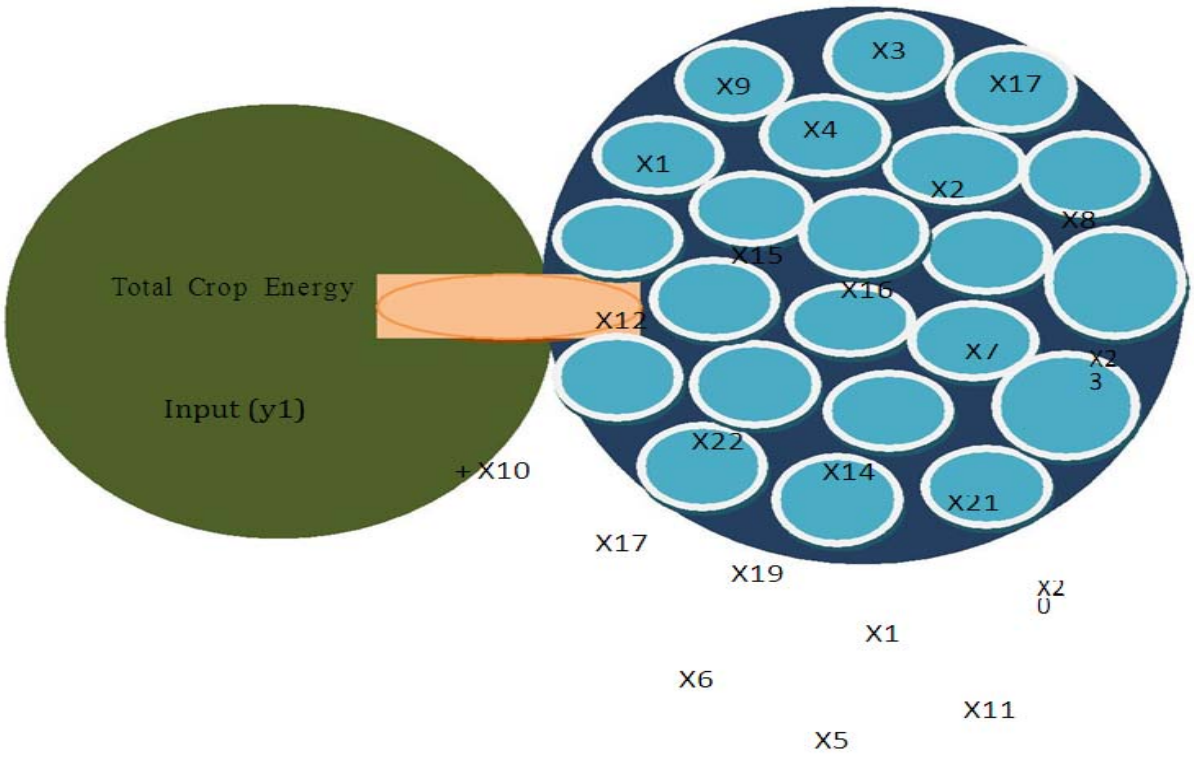
Table 11: Coefficient of correlation (r) between total crop energy balance (y1) and 23 independent variables(x1-x23)

Variables	r value	Remarks
Age(x1)	0.1074	
Education(x2)	-0.2023	
Family size(x3)	0.0748	
Male female ratio(x4)	-0.0371	
Occupation(x5)	-0.0999	
Cropping intensity(x6)	-0.0598	
Farm size (x7)	-0.1699	
Homestead land(x8)	-0.1202	
Expenditure allotment(x9)	0.1341	
% of farming	0.3163	*
expenditure(x10)		
Total income(x11)	0.1170	
Irrigation index(x12)	-0.1870	
Economic motivation(x13)	-0.0784	
Market orientation(x14)	-0.0437	
Labour engaged(x15)	-0.0106	
Average labour engaged per	0.0629	
operation(x16)		
Electricity consumption(x17)	0.0821	
Energy consumption per	0.0597	
capita(x18)		
Diesel consumption(x19)	0.2156	
Consumption of LPG(x20)	0.0055	
Consumption of kerosene(x21)	-0.0737	
Media responsiveness(x22)	0.0797	
Decision matrix(x23)	0.1548	

r>0.274 *(5% level of significance) r>0.356**(1% level of significance)

Model-1



X10= per cent of farming

Results:-It has been found that the variable, per cent of farming Expenditure (x10), has recorded a positive and significant correlation with Total Crop Energy Input (y1).

Revelation:- The higher the farming expenditure, the higher has been the application of energy intensive input. So, total crop energy here has been found to have strong relegation to farming expenditure. A cost intensive farm has also been an energy intensive farm as well.

Table 12: Coefficient of correlation (r) between total crop energy output (y2) and 23 independent variables(x1-x23)

Variables	r value	remarks
Age(x1)	-0.0024	
Education(x2)	-0.0101	
Family size(x3)	-0.1623	
Male female ratio(x4)	-0.1690	
Occupation(x5)	-0.1185	
Cropping intensity(x6)	-0.2871	
Farm size (x7)	-0.1691	
Homestead land(x8)	-0.1404	

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Expenditure	0.7856	**
allotment(x9)		
% of farming	0.3820	**
expenditure(x10)		
Total income(x11)	0.0592	
Irrigation index(x12)	-0.2544	
Economic	0.2127	
motivation(x13)		
Market orientation(x14)	-0.1588	
Labour engaged(x15)	-0.1091	
Average labour engaged	-0.0739	
per operation(x16)		
Electricity	0.0994	
consumption(x17)		
Energy consumption	0.2092	
per capita(x18)		
Diesel	-0.1200	
consumption(x19)		
Consumption of	-0.2114	
LPG(x20)		
Consumption of	-0.0897	
kerosene(x21)		
Media	-0.1237	
responsiveness(x22)		
Decision matrix(x23)	-0.0015	

r>0.356**(1% level of significance)

r>0.274 *(5% level of significance)

Table 13: Coefficient of correlation (r) between Total Domestic Energy Consumption(y3) and 23 independent variables(x1-x23)

Variables	r value	Remarks
Age(x1)	-0.0059	
Education(x2)	0.0031	
Family size(x3)	-0.2251	
Male female ratio(x4)	-0.0431	
Occupation(x5)	-0.0778	
Cropping intensity(x6)	-0.0166	
Farm size (x7)	0.1630	
Homestead land(x8)	-0.0561	
Expenditure allotment(x9)	0.3631	**
% of farming	0.3990	**
expenditure(x10)		
Total income(x11)	-0.0355	
Irrigation index(x12)	-0.0737	

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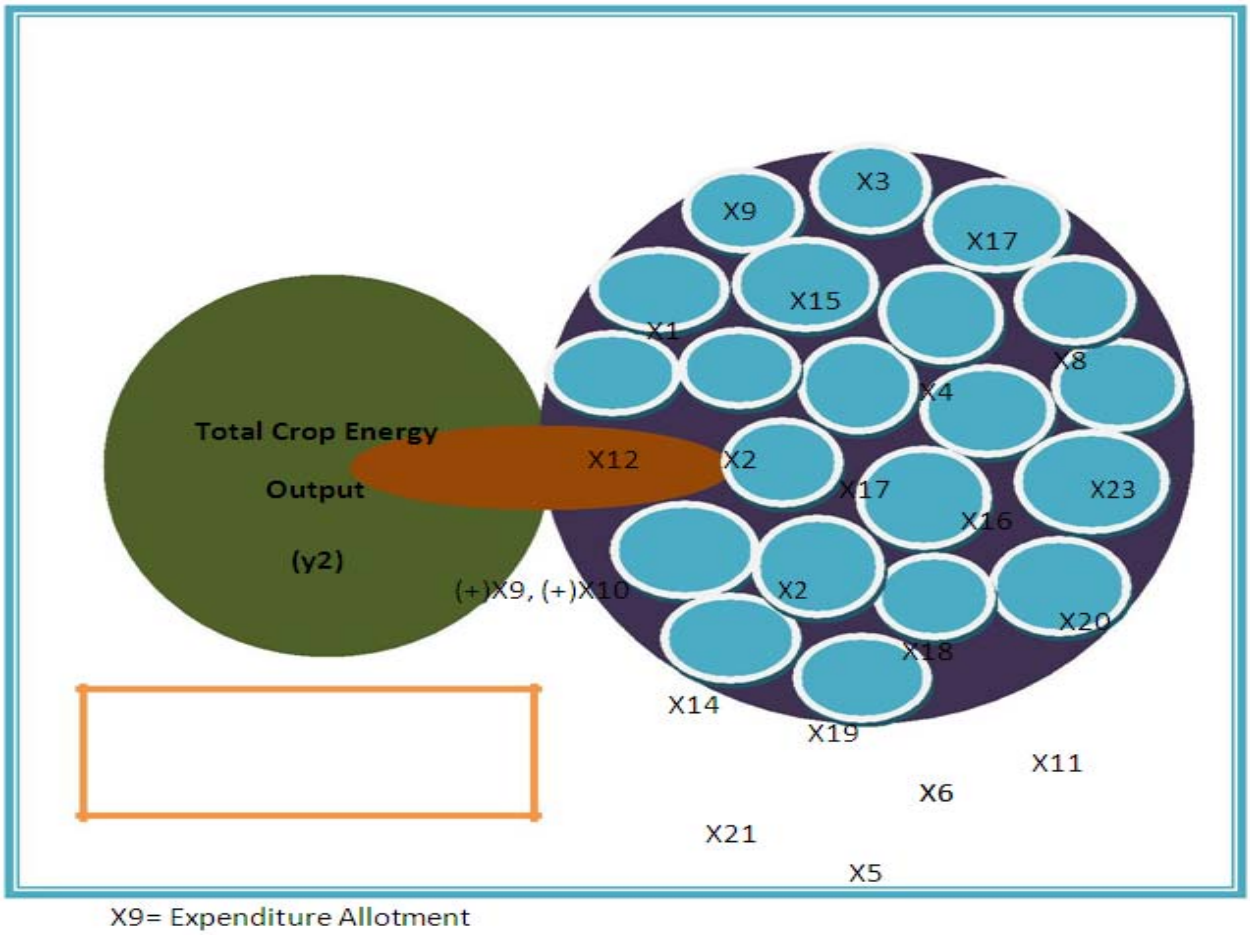
Economic motivation(x13)	0.3562	**
Market orientation(x14)	0.1725	
Labour engaged(x15)	-0.0317	
Average labour engaged per	-0.0938	
operation(x16)		
Electricity consumption(x17)	0.1529	
Energy consumption per	0.2274	
capita(x18)		
Diesel consumption(x19)	-0.0324	
Consumption of LPG(x20)	-0.2823	
Consumption of	0.3217	*
kerosene(x21)		
Media responsiveness(x22)	-0.4172	
Decision matrix(x23)	-0.1773	

r>0.274 *(5% level of significance) r>0.356**(1% level of significance)

Model-2



X9= Expenditure Allotment

X10= per cent of farming

Results:-It has been found that the variable Expenditure Allotment (x9) and Per Cent of farming Expenditure(x10) has recorded a positive significant correlation with Total Crop Energy output (y2).

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Revelation: - Expenditure allotment is an important determinant to decide on what enterprise and with what proportion; the expenditure will be incurred by the farmer. The higher the farming expenditure, the higher has been the application of energy intensive input. So, total crop energy here has been found to have strong relation to farming expenditure. Hence, a cost intensive farm has also been an energy intensive farm as well.

Table 13: Coefficient of correlation (r) between Total Domestic Energy Consumption(y3) and 23 independent variables(x1-x23)

Variables	r value	Remarks
Age(x1)	-0.0059	
Education(x2)	0.0031	
Family size(x3)	-0.2251	
Male female ratio(x4)	-0.0431	
Occupation(x5)	-0.0778	
Cropping intensity(x6)	-0.0166	
Farm size (x7)	0.1630	
Homestead land(x8)	-0.0561	
Expenditure allotment(x9)	0.3631	**
% of farming	0.3990	**
expenditure(x10)		
Total income(x11)	-0.0355	
Irrigation index(x12)	-0.0737	
Economic motivation(x13)	0.3562	**
Market orientation(x14)	0.1725	
Labour engaged(x15)	-0.0317	
Average labour engaged per	-0.0938	
operation(x16)		
Electricity consumption(x17)	0.1529	
Energy consumption per	0.2274	
capita(x18)		
Diesel consumption(x19)	-0.0324	
Consumption of LPG(x20)	-0.2823	
Consumption of	0.3217	*
kerosene(x21)		
Media responsiveness(x22)	-0.4172	
Decision matrix(x23)	-0.1773	

r>0.274 *(5% level of significance) r>0.356**(1% level of significance)

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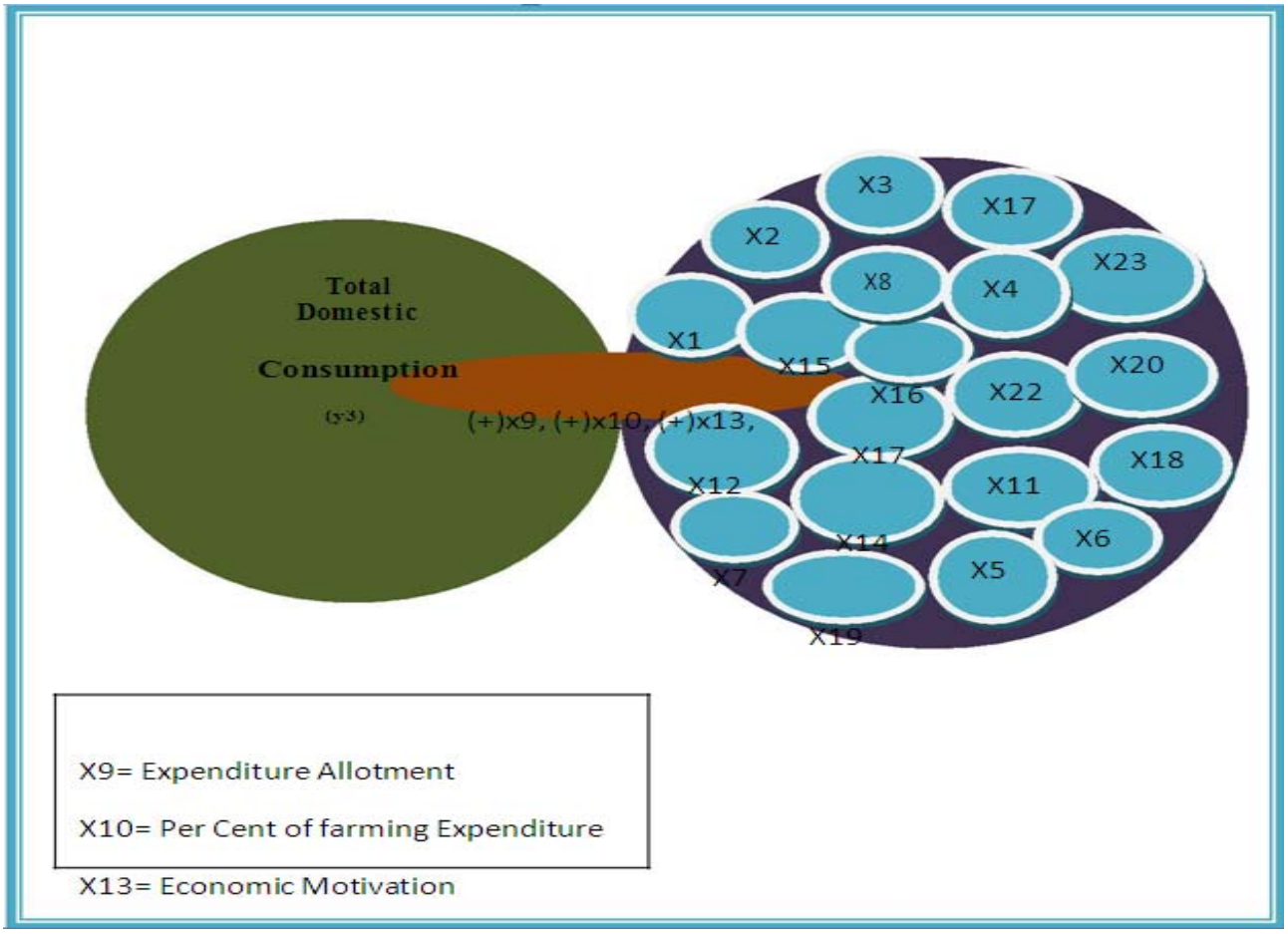
Model 3



Results:-It has been found that the variable Expenditure Allotment (x9), Per Cent of farming Expenditure(x10), Economic Motivation(x13) and Consumption of Kerosene(x21) has recorded a positive significant correlation with Total Domestic energy Consumption (y3).

Revelation: The higher the farm inputs, the higher has been the consumption of energy intensive input. So, total domestic energy consumption, here has been found to have strong relation to allotted expenditure, economic motivation and consumption of kerosene.

Table 14: Coefficient of correlation (r) between total farm residue output(y4) and 23 independent variables(x1-x23)

Variables	r value	Remarks
Age(x1)	-0.2741	
Education(x2)	-0.0797	
Family size(x3)	-0.0621	
Male female ratio(x4)	0.0108	
Occupation(x5)	0.0322	
Cropping intensity(x6)	0.2161	
Farm size (x7)	-0.2790	
Homestead land(x8)	-0.2195	

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Expenditure allotment(x9)	-0.0328	
% of farming	-0.3399	
expenditure(x10)		
Total income(x11)	-0.0528	
Irrigation index(x12)	0.1518	
Economic motivation(x13)	-0.0161	
Market orientation(x14)	0.1069	
Labour engaged(x15)	-0.2768	
Average labour engaged per	-0.1111	
operation(x16)		
Electricity	0.3519	*
consumption(x17)		
Energy consumption per	0.3663	**
capita(x18)		
Diesel consumption(x19)	-0.1106	
Consumption of LPG(x20)	0.1046	
Consumption of	-0.1237	
kerosene(x21)		
Media responsiveness(x22)	0.4911	
Decision matrix(x23)	-0.0123	

r>0.274 *(5% level of significance) r>0.356**(1% level of significance)
X17= Electricity Consumption

X18= Energy consumption per capita

Result: It has been found that the variable electricity consumption(x17) per capita has recorded a positive significant correlation with total farm residue output (y4)

Revelation: Here it has been found to have a strong relation to electricity consumption. This is indicating that a farm family undergoing modernization process in form of higher electricity consumption, has also been conspicuous by following an energy intensive farming.

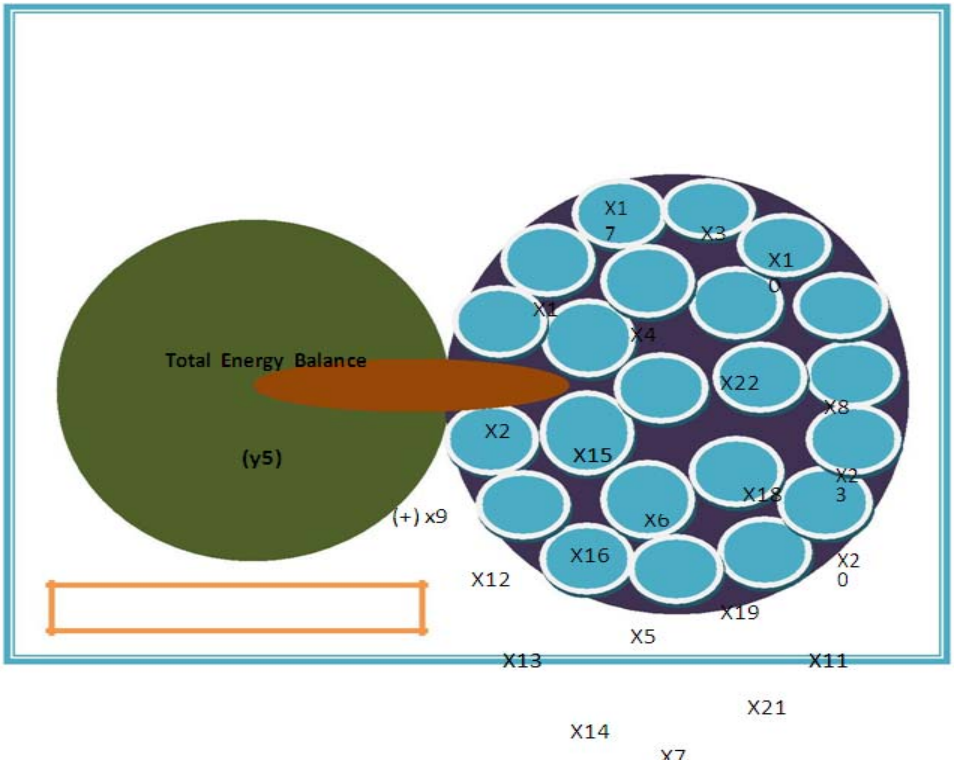
Table 15: Coefficient of correlation (r) between total energy balance (y5) and 23 independent variables(x1-x23)

Variables	r value	Remarks
Age(x1)	-0.0655	
Education(x2)	-0.0498	
Family size(x3)	-0.1230	
Male female ratio(x4)	-0.2092	
Occupation(x5)	-0.0849	
Cropping intensity(x6)	-0.1131	
Farm size (x7)	-0.3297	
Homestead land(x8)	-0.2073	
Expenditure allotment(x9)	0.5736	**
% of farming	0.0809	

expenditure(x10)		
Total income(x11)	-0.0028	
Irrigation index(x12)	-0.0775	
Economic motivation(x13)	0.1490	
Market orientation(x14)	-0.1512	
Labour engaged(x15)	-0.2810	
Average labour engaged per	-0.1992	
operation(x16)		
Electricity consumption(x17)	0.1493	
Energy consumption per	0.2279	
capita(x18)		
Diesel consumption(x19)	-0.2227	
Consumption of LPG(x20)	-0.1046	
Consumption of	-0.1685	
kerosene(x21)		
Media responsiveness(x22)	0.2028	
Decision matrix(x23)	-0.0053	

r>0.274 *(5% level of significance) r>0.356**(1% level of significance)

Model-5



X9= Expenditure Allotment

Result: It has been found that the variable per cent of farming Expenditure (x10) has recorded a positive significant correlation with Total Energy Balance (y5).

Revelation:- Expenditure allotment is an important determinant to decide on what enterprise and at what proportion the expenditure will be incurred by the farmer.

The higher the farming expenditure, the higher has been the appropriation of energy intensive farming. So, total energy Balance, here, has been found to have strong relation to farming expenditure.

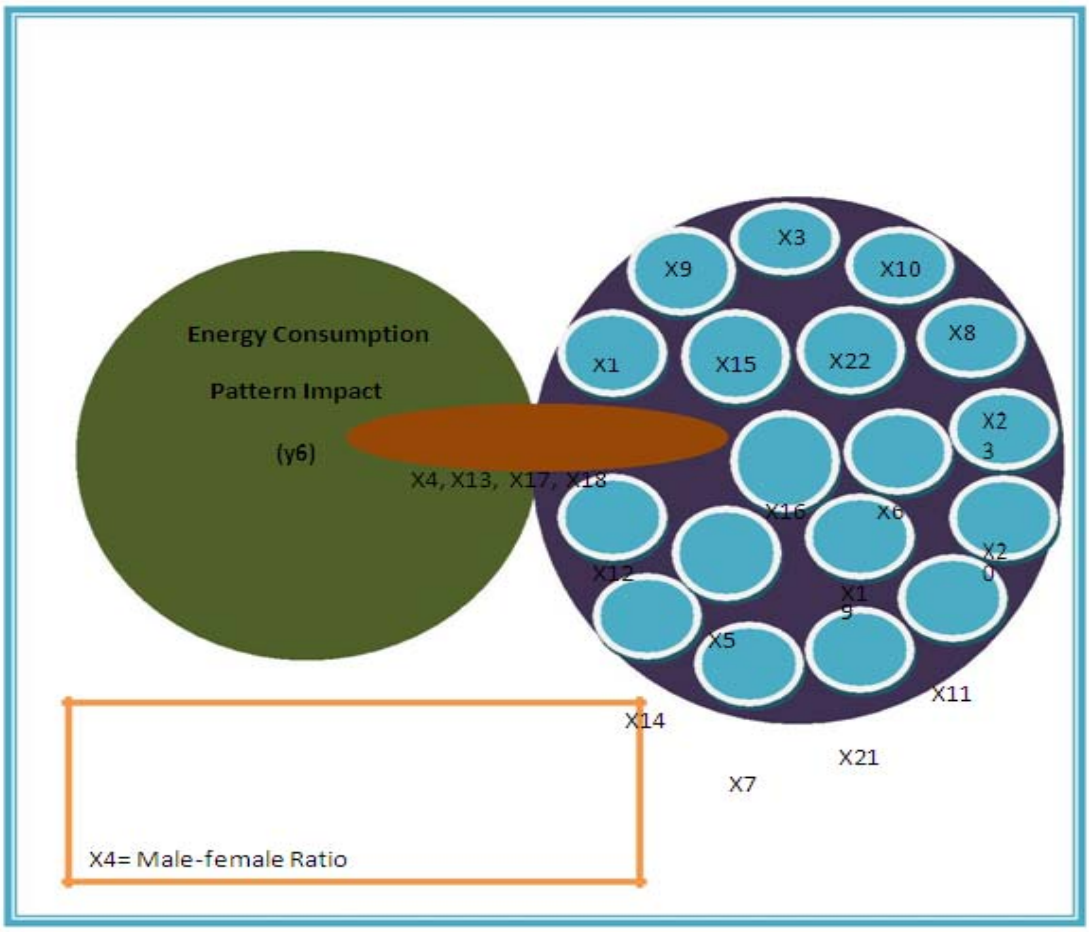
Table 16: Coefficient of correlation (r) between energy consumption pattern impact (y6) and 23 independent variables(x1-x23

Variables	r value	Remarks
Age(x1)	0.0465	
Education(x2)	0.2001	
Family size(x3)	-0.0077	
Male female ratio(x4)	0.3239	*
Occupation(x5)	0.1778	
Cropping intensity(x6)	0.1114	
Farm size (x7)	0.1601	
Homestead land(x8)	0.0013	
Expenditure allotment(x9)	0.1418	
% of farming	0.1108	
expenditure(x10)		
Total income(x11)	0.0816	
Irrigation index(x12)	-0.0114	
Economic motivation(x13)	0.4186	**
Market orientation(x14)	0.2155	
Labour engaged(x15)	0.1436	
Average labour engaged per	0.0584	
operation(x16)		
Electricity	0.3671	**
consumption(x17)		
Energy consumption per	0.3386	*
capita(x18)		
Diesel consumption(x19)	0.1817	
Consumption of LPG(x20)	0.2381	
Consumption of	0.2000	
kerosene(x21)		
Media responsiveness(x22)	-0.1798	
Decision matrix(x23)	0.0667	

r>0.274 *(5% level of significance)

r>0.356**(1% level of significance)

Model-6



Result: It has been found that the variables male female ratio(x4), economic motivation(x13), electricity consumption(x17) and energy consumption per capita has recorded a positive significant correlation with total domestic energy consumption pattern impact(y6)

Revelation: The higher the farm inputs, the higher has been the consumption of energy intensive input. So, total domestic energy consumption Pattern here has been found to have strong relation to Male female ratio, economic motivation and consumption of Electricity and Energy consumption per capita.

PATH ANALYSIS: THE DIRECTION OF INTERACTION

Table 29: Direct, Indirect and Residual effect; Total Crop Energy Input (y1) Vs 23 Exogenous Variables(x1 to x23)

Variables	Total Effect	Direct	Total	Highest	
	(r)	Effect	Indirect	Indirect Effect	
		(DE)	Effect		
			(IE=r-DE)		

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Age(x1)	0.1074	-0.1142		0.3223(X18)	
			0.2216		
Education(x2)	-0.2023	-0.1520		-0.1277(X18)	
			-0.0503		
Family size(x3)	0.0748	-0.0715		0.2427(X18)	
			0.1463		
Male female ratio(x4)	-0.0371	-0.1308		-0.2859(X15)	
			0.0937		
Occupation(x5)	-0.0999	-0.0483		-0.2209(X15)	
			-0.0516		
Cropping	-0.0598	-0.0141		0.4023(X15)	
intensity(x6)			-0.0457		
Farm size (x7)	-0.1699	-0.4123		-0.5965(X15)	
			0.2424		
Homestead land(x8)	-0.1202	-0.2796		0.2941(X15)	
			0.1594		
Expenditure	0.1341	0.0588		-0.6177(X18)	
allotment(x9)			0.0753		
% of farming	0.3163	0.4990		-0.3323(X15)	
expenditure(x10)			-0.1827		
Total income(x11)	0.1170	0.2983		-0.5290(X15)	
			-0.1813		
Irrigation index(x12)	-0.1870	-0.1907	0.0037	0.1778(X15)	
Economic	-0.0784	-0.6276		0.2424(X17)	
motivation(x13)			0.5492		
Market	-0.0437	0.4242		-0.2930(X13)	
orientation(x14)			-0.4679		
Labour engaged(x15)	-0.0106	-1.0467		-0.2349(X7)	
			1.0361		
Average labour	0.0629	0.7451		-1.0039(X15)	
engaged per					
operation(x16)			-0.6822		
Electricity	0.0821	1.4998		-1.2389(X18)	
consumption(x17)			-1.4177		
Energy consumption	0.0597	-1.2985		1.4309(X17)	
per capita(x18)			1.3582		
Diesel	0.2156	0.3192		0.1888(X17)	
consumption(x19)			-0.1036		
Consumption of	0.0055	0.3048		0.8824(X17)	
LPG(x20)			-0.2993		
Consumption of	-0.0737	0.0413		-0.3510(X15)	
			-		
kerosene(x21)					
			0.115		
Media	0.0797	-0.3622		0.4174(X17)	

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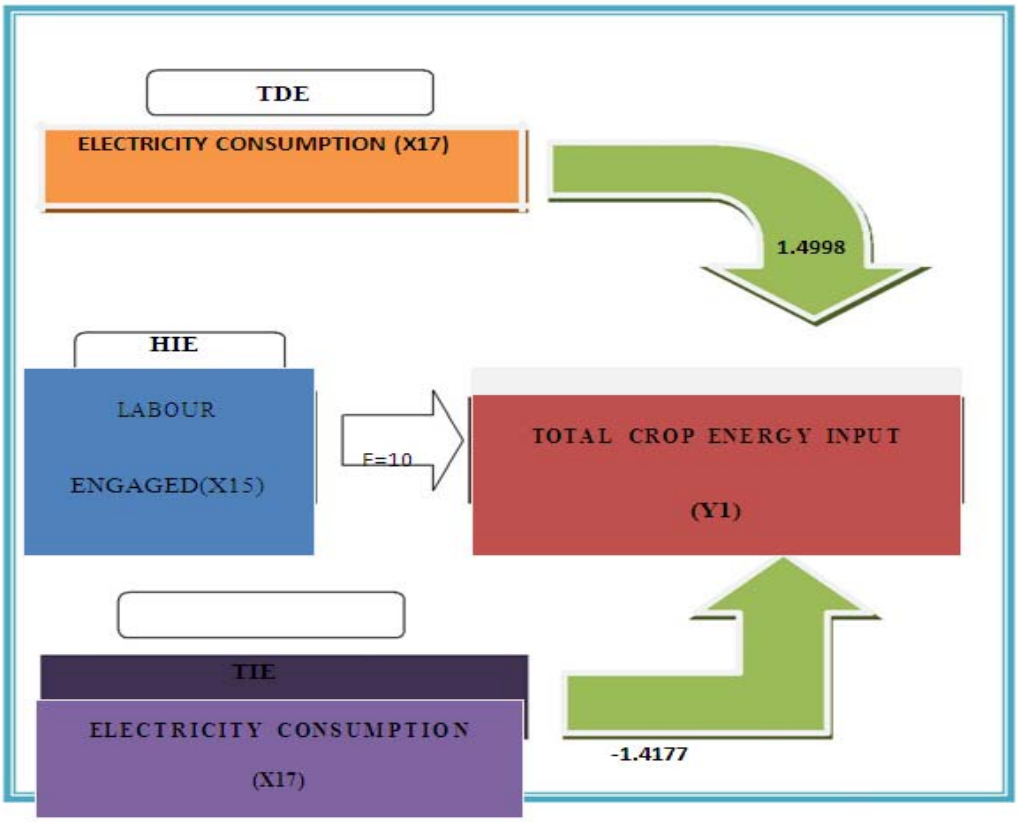
responsiveness(x22)			0.4419		
Decision matrix(x23)	0.1548	-0.1396	0.2944	0.2277(X19)	
Residual effect-0.4851					

Model 13



Results

Table presents the Path Analysis where in the total effect of exogenous variables on consequent variable has been decomposed into Direct, Indirect and Residual effects. It has been evinced that variable electricity consumption (x17) has exerted highest direct effect (1.4998) as well as total indirect effect (-1.4177)

Revelation

The path analysis depicts the contribution electricity consumption at the domestic level has been dominant over other energy consumption. So the farm families being reticulate to dedicated power supply to run domestic chores, has also been the consumer of highest of level energy to organize farm energy as well.

The other variables, labour engaged expecting has recorded the highest indirect effect to imply that this variable has got high degrees of companionship to characterize the other variables.

Table 30: Direct, Indirect and Residual effect; Total Crop Energy output (y2) Vs 23 Exogenous Variables(x1 to x23)

Variables	Total Effect (r)	Direct Effect (DE)	Total Indirect Effect (IE=r-DE)	Highest Indirect Effect
Age(x1)	-0.0024	-0.0381	0.0357	-0.2212(X18)
Education(x2)	-0.0101	-0.1743	0.1642	-0.1736(X9)
Family size(x3)	-0.1623	0.2069	-0.3692	-0.3132(X9)
Male female ratio(x4)	-0.1690	0.0599	-0.2289	0.1896(X15)
Occupation(x5)	-0.1185	0.0432	-0.1617	0.1464(X15)
Cropping intensity(x6)	-0.2871	-0.0574	-0.2297	-0.4325(X9)
Farm size (x7)	-0.1691	-0.3501	0.181	0.3955(X15)
Homestead land(x8)	-0.1404	-0.0322	-0.1082	0.1950(X15)
Expenditure	0.7856	0.9513		0.4239(X18)
allotment(x9)			-0.1657	
% of farming	0.3820	-0.0380		0.4437(X9)
expenditure(x10)			0.42	
Total income(x11)	0.0592	-0.0571	0.1163	0.4019(X9)
Irrigation index(x12)	-0.2544	0.0975	-0.3519	-0.3939(X9)
Economic	0.2127	0.0230		0.1962(X9)
motivation(x13)			0.1897	
Market	-0.1588	-0.1491		-0.1467(X9)
orientation(x14)			-0.0097	
Labour engaged(x15)	-0.1091	0.6940	-0.8031	-0.6435(X16)
Average labour	-0.0739	-0.6710		0.6656(X15)
engaged per				
operation(x16)			0.5971	
Electricity	0.0994	-0.9756		0.8502(X18)
consumption(x17)			1.075	
Energy consumption	0.2092	0.8911		-0.9309(X17)
per capita(x18)			-0.6819	
Diesel	-0.1200	0.0229		-0.1228(X17)
consumption(x19)			-0.1429	
Consumption of	-0.2114	-0.1004		-0.5740(X17)
LPG(x20)			-0.111	
	104			
Consumption of	-0.0897	-0.0850		0.0736(X16)
kerosene(x21)			-0.0047	
Media	-0.1237	-0.0134		-0.2716(X17)
responsiveness(x22)			-0.1103	
Decision matrix(x23)	-0.0015	-0.0232	0.0217	-0.1280(X17)

Residual Effect-0.1425

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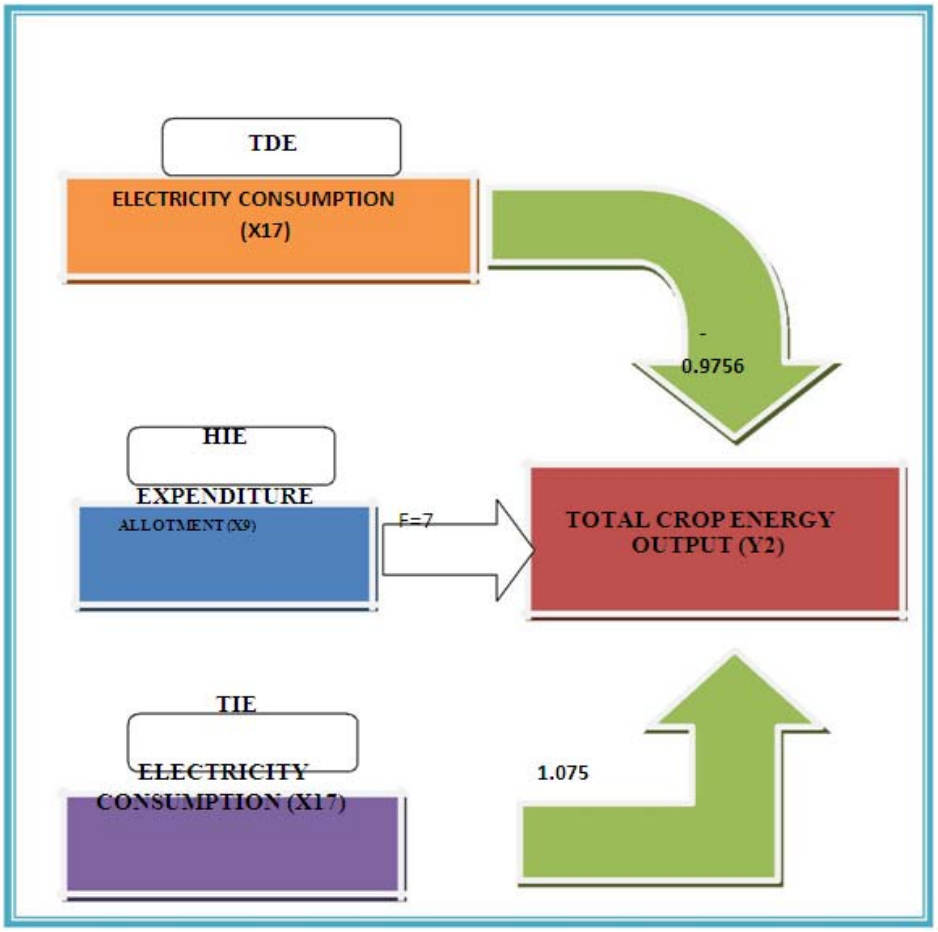
Model-14



Result

Table presents the Path Analysis where in the total effect of exogenous variables on consequent variable has been decomposed into Direct, Indirect and Residual effects. It has been evinced that the variable electricity consumption (x17) has exerted highest direct effect (-0.9756) as well as total indirect effect (1.075)

Revelation

The path analysis depicts the contribution to electricity consumption at the domestic level has been dominant over other energy consumption. So the farm families being reticulate to dedicated power supply to run domestic chores has also been the consumer of highest of level energy organize farm energy as well.

The variable expenditure allotment(x9 has routed the highest indirect effect as many as seven exogenous variables to evince that this variable has got high degrees of companionship to characterize the other variable.

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Table 31: Direct, Indirect and Residual effect; Total Domestic Energy Consumption (y3) Vs 23 Exogenous Variables(x1 to x23)

Variables	Total	Direct	Total	Highest Indirect
	Effect	Effect	Indirect	Effect
	(r)	(DE)	Effect	
			(IE=r-DE)	
Age(x1)	-	0.0821		-0.1367(X17)
	0.0059		-0.088	
Education(x2)	0.0031	0.0778	-0.0747	-0.0845(X20)
Family size(x3)	-	-0.0913		-0.1092(X10)
	0.2251		-0.1338	
Male female ratio(x4)	-	-0.2124		0.1210(X17)
	0.0431		0.1693	
Occupation(x5)	-	-0.0482		0.1032(X17)
	0.0778		-0.0296	
Cropping intensity(x6)	-	0.3078		-0.1641(X17)
	0.0166		-0.3244	
Farm size (x7)	0.1630	0.3006	-0.1376	-0.2931(X17)
Homestead land(x8)	-	-0.0754		0.1427(X7)
	0.0561		0.0193	
Expenditure allotment(x9)	0.3631	-0.0248	0.3879	0.3055(X17)
% of farming	0.3990	0.3822		-0.1073(X17)
expenditure(x10)			0.0168	
Total income(x11)	-	0.0160		0.1860(X7)
	0.0355		-0.0515	
Irrigation index(x12)	-	-0.0602		0.1590(X6)
	0.0737		-0.0135	
Economic motivation(x13)	0.3562	0.0839	0.2723	0.1453(X17)
Market orientation(x14)	0.1725	0.1443	0.0282	0.0874(X14)
Labour engaged(x15)	-	0.2265		-0.2459(X16)
	0.0317		-0.2582	
Average labour engaged per	-	-0.2564		0.2172(X15)
operation(x16)	0.0938		0.1626	
Electricity	**0.1529**	**0.8992**		**-0.3964(X14)**
consumption(x17)			-0.7463	
Energy consumption per	0.2274	-0.1951		0.8579(X17)
capita(x18)			0.4225	
Diesel consumption(x19)	-	-0.1940		0.1131(X17)
	0.0324		0.1616	
Consumption of LPG(x20)	-	-0.6737		0.5239(X17)
	0.2823		0.3914	
Consumption of	0.3217	0.0473		0.1188(X14)
kerosene(x21)			0.2744	

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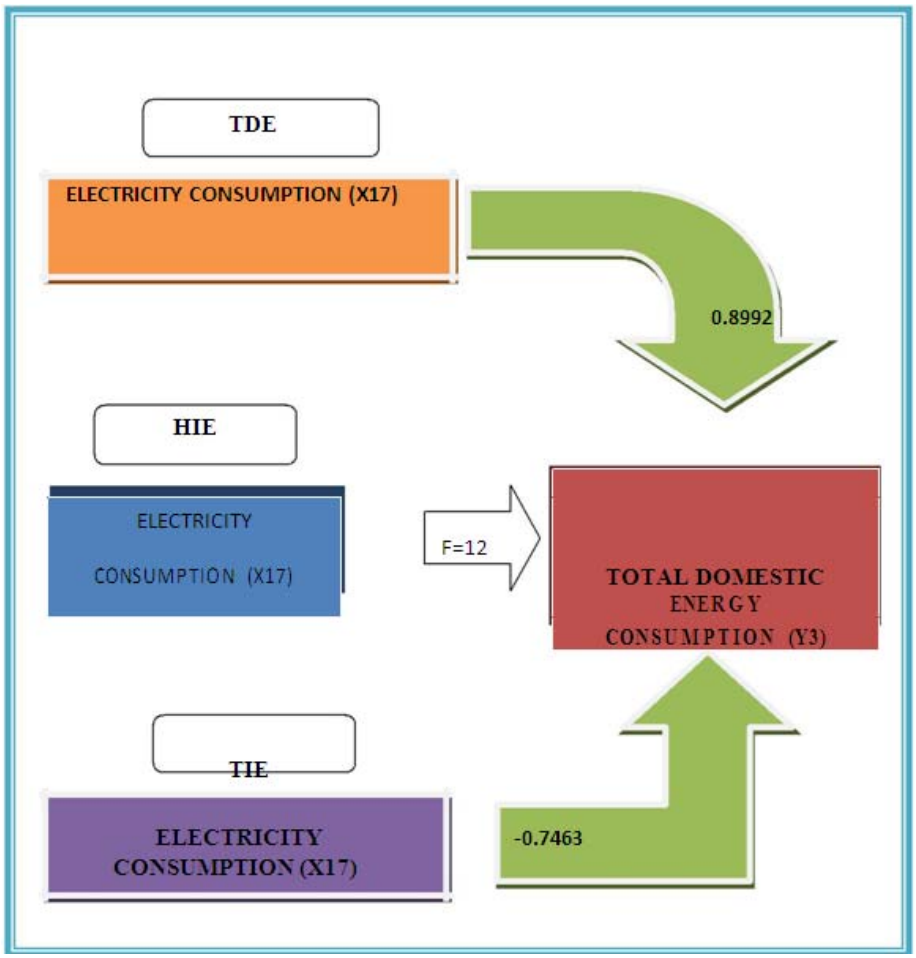
Media responsiveness(x22)	-	-0.2912		0.2503(X17)
	0.4172		-0.126	
Decision matrix(x23)	-	0.0673		-0.1619(X14)
	0.1773		-0.2446	

Residual Effect-0.2852

Model-15



Result

Table presents the Path Analysis where in the total effect of exogenous variables on consequent variable has been decomposed into Direct, Indirect and Residual effects. It has been evinced that variable electricity consumption (x17) has exerted highest direct effect (0.8992) as well as total indirect effect (-0.7463)

Revelation

The variables, Electricity consumption expecting has recorded the highest indirect effect imply that this variable has got high degrees of companionship to characterize the other variable. It denote that every may be the electricity consumed as a corporeal energy source at domestic level, still counts humangasly.

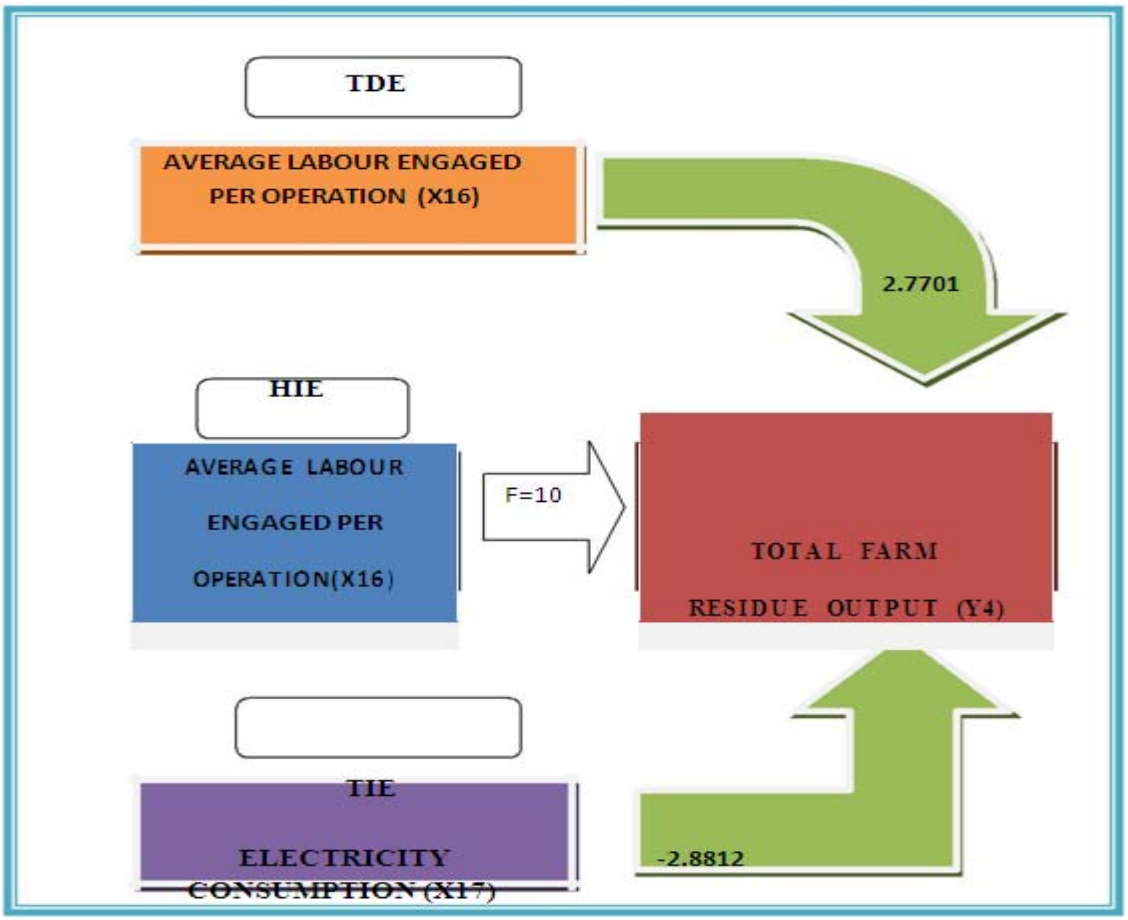
Table 32: Direct, Indirect and Residual effect; Total Farm residue output (y4) Vs 23 Exogenous Variables(x1 to x23)

Variables	Total Effect (r)	Direct Effect (DE)	Total Indirect Effect (IE=r-DE)	Highest Indirect Effect
Age(x1)	-0.2741	0.0392	-0.3133	0.8182(x16)
Education(x2)	-0.0797	0.0192	-0.0989	-0.3480(x16)
Family size(x3)	-0.0621	0.1305	-0.1926	0.6197(x16)
Male female ratio(x4)	0.0108	0.0926	-0.0818	-0.7489(x15)
Occupation(x5)	0.0322	0.0176	0.0146	-0.5785(x15)
Cropping intensity(x6)	0.2161	0.2444	-0.0283	-1.0792(x16)
Farm size (x7)	-0.2790	0.1248	-0.4038	-1.5625(x15)
Homestead land(x8)	-0.2195	-0.1143	-0.1052	-0.7704(x15)
Expenditure	-0.0328	-0.3431		0.8752(x18)
allotment(x9)			0.3103	
% of farming	-0.3399	-0.0609		-0.8703(x15)
expenditure(x10)			-0.279	
Total income(x11)	-0.0528	-0.2757	0.2229	1.4673(x16)
Irrigation index(x12)	0.1518	-0.0198	0.1716	-0.5479(x16)
Economic	-0.0161	-0.1165		-0.4360(x16)
motivation(x13)			0.1004	
Market orientation(x14)	0.1069	0.1020	0.0049	-0.2023(x16)
Labour engaged(x15)	-0.2768	-2.7417	2.4649	2.6568(x16)
Average labour engaged	-0.1111	2.7701	-2.8812	-2.6269(x15)
		108		
per operation(x16)				
Electricity	0.3519	-1.0585		-1.0585(x17)

consumption(x17)			1.4104	
Energy consumption per	0.3663	1.8399		1.8399(x18)
capita(x18)			-1.4736	
Diesel consumption(x19)	-0.1106	-0.0571	-0.0535	-0.1750(x15)
Consumption of	0.1046	-0.0561		1.2252(x18)
LPG(x20)			0.1607	
Consumption of	-0.1237	-0.1541		-0.3038(x16)
kerosene(x21)			0.0304	
Media	0.4911	0.0098		0.4266(x18)
responsiveness(x22)			0.4813	
Decision matrix(x23)	-0.0123	0.0813	-0.0936	-0.1389(x17)

Residual Effect-0.1435

Model 16



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Result

Table presents the Path Analysis where in the total effect of exogenous variables on consequent variable has been decomposed into Direct, Indirect and Residual effects. It has been evinced that variable average labour engaged per operation (x16) has exerted highest direct effect (2.7701) and electricity consumption(x17) as highest total indirect effect (-2.8812)

Revelation

Average labour engaged per operation has substantially impacted on the Total Energy Balance with suggested as positive value. This could suggest that farms having required higher labour force for each operation are more efficient in total farm residue output. The path analysis depicts the contribution labour engaged at the farm level has been dominant over other energy consumption. Electricity consumption(x17) here has also been operationally integrative to total energy balance by indirectly impacting the performance of other exogenous variables.

The variable average labour engaged per operation (x16) has routed the highest indirect of as many as ten variables to prove its operational viscosity with other variables.

Table 32: Direct, Indirect and Residual effect; Total energy Balance (y5) Vs 23 Exogenous Variables(x1 to x23)

Variables	Total	Direct	Total	Highest
	Effect	Effect	Indirect	Indirect Effect
	(r)	(DE)	Effect	
			(IE=r-DE)	
Age(x1)	-0.0655	0.0707	-0.1362	-0.2476(x18)
Education(x2)	-0.0498	-0.2019	0.1521	0.1483(x9)
Family size(x3)	-0.1230	0.1129	-0.2359	.2675(x9)
Male female ratio(x4)	-0.2092	0.1082	-0.3174	0.1487(x18)
Occupation(x5)	-0.0849	-0.0042	-0.0807	0.1238(x17)
Cropping intensity(x6)	-0.1131	-0.0488	-0.0643	0.3694(x9)
Farm size (x7)	-0.3297	-0.3552	0.0255	0.3438(x18)
Homestead land(x8)	-0.2073	-0.0038	-0.2035	-0.1686(x7)
Expenditure allotment(x9)	0.5736	0.8125	-0.2389	0.4745(x18)
% of farming	0.0809	-0.2204		0.3790(x9)
expenditure(x10)			0.3013	
Total income(x11)	-0.0028	-0.0748	0.072	-0.3805(x16)
Irrigation index(x12)	-0.0775	0.2167	-0.2942	-0.3364(x9)
Economic	0.1490	0.1016		-0.1744(x17)
motivation(x13)			0.0474	
Market orientation(x14)	-0.1512	-0.2034	0.0522	-0.1253(x9)
Labour engaged(x15)	-0.2810	0.2686	-0.5496	-0.2845(x16)
Average labour engaged	-0.1992	-0.2967		0.2576(x15)

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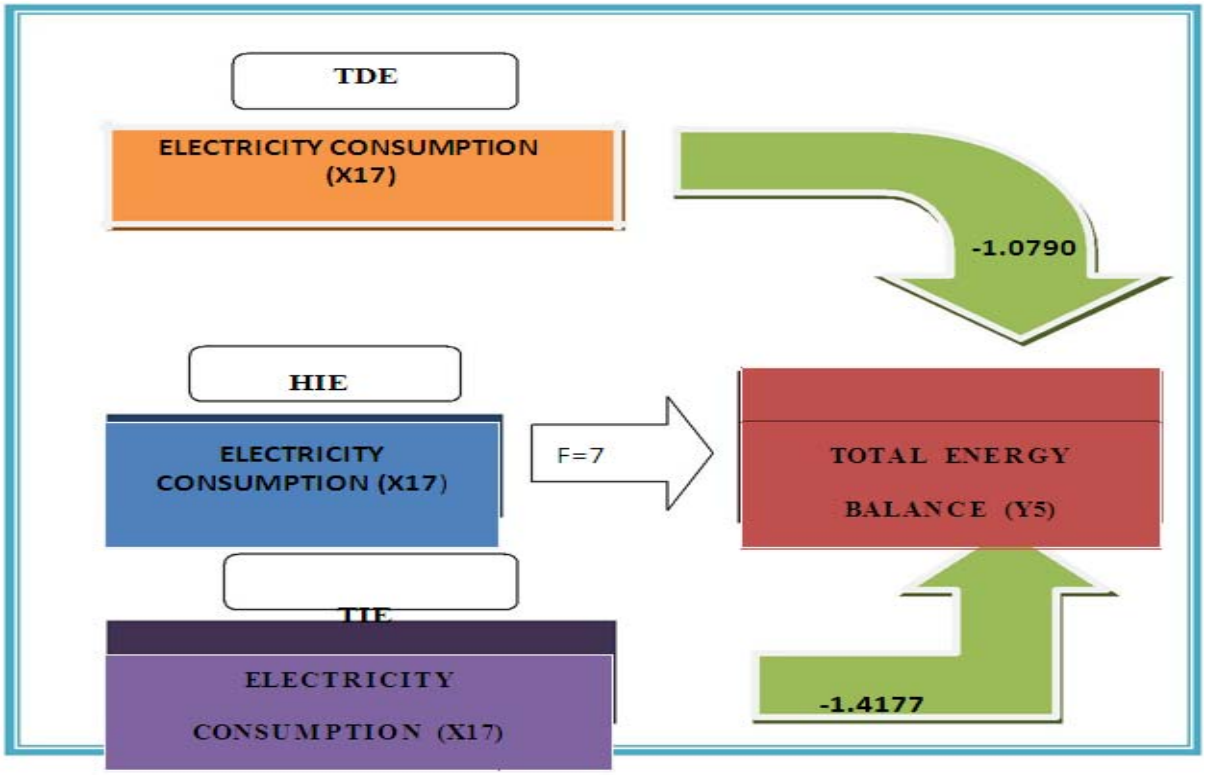
per operation(x16)			0.0975	
Electricity	0.1493	-1.0790		0.2760(x9)
consumption(x17)			1.2283	
Energy consumption per	0.2279	0.9975		-1.0294(x17)
capita(x18)			-0.7696	
Diesel consumption(x19)	-0.2227	-0.0430	-0.1797	-0.1358(x17)
Consumption of	-0.1046	-0.0038		-0.6348(x17)
LPG(x20)			-0.1008	
Consumption of	-0.1685	-0.1103		-0.0531(x22)
kerosene(x21)			-0.0582	
Media	0.2028	0.2118		-0.3003(x17)
responsiveness(x22)			-0.009	
Decision matrix(x23)	-0.0053	-0.0050	-0.0003	-0.1416(x17)

Residual Effect-0.3084

Model 17



Results

Table presents the Path Analysis where in the total effect of exogenous variables on consequent variable has been decomposed into Direct, Indirect and Residual effects. It has been evinced that the variable electricity consumption (x17) has exerted the highest direct effect (-1.0790) and also the variable electricity consumption(x17) as highest total indirect effect (-1.4177).

Revelation

Electricity consumption has substantially impacted on the Total Energy Balance but with a negative value. The path analysis depicts the contribution of electricity consumption at the domestic level has been dominant over other energy consumption. The variable electricity consumption (x17) has routed the highest indirect of as many as seven variables to prove its operational viscosity with other variables.

Table 33: Direct, Indirect and Residual effect; Energy Consumption Pattern Impact (y6) Vs 23 Exogenous Variables(x1 to x23)

Variables	Total Effect (r)	Direct Effect (DE)	Total Indirect Effect (IE=r-DE)	Highest Indirect Effect
Age(x1)	0.0465	0.2465	-0.2	-0.1850(x17)
Education(x2)	0.2001	0.2634	-0.0633	0.0988(x3)
Family size(x3)	-0.0077	-0.2775	0.2698	0.1275(x18)
Male female ratio(x4)	0.3239	0.2979	0.026	0.1637(x17)
Occupation(x5)	0.1778	-0.0243	0.2021	0.1396(x17)
Cropping intensity(x6)	0.1114	0.2207	-0.1093	-0.2221(x17)
Farm size (x7)	0.1601	-0.0658	0.2259	0.3614(x17)
Homestead land(x8)	0.0013	0.0444	-0.0431	0.1342(x15)
Expenditure	0.1418	-0.1934		0.4133(x17)
allotment(x9)			0.3352	
% of farming	0.1108	0.1521		0.1517(x15)
expenditure(x10)			-0.0413	
Total income(x11)	0.0816	-0.0261	0.1077	0.4290(x17)
Irrigation index(x12)	-0.0114	-0.0757	0.0643	-0.0811(x15)
Economic	0.4186	0.4595		0.1966(x17)
motivation(x13)			-0.0409	
Market orientation(x14)	0.2155	-0.1148	0.3303	0.2117(x13)
Labour engaged(x15)	0.1436	0.4778	-0.3342	-0.3270(x16)
Average labour engaged	0.0584	-0.3410		0.4582(x15)
per operation(x16)			0.3994	
Electricity	0.3671	1.2167		-0.6508(x18)
consumption(x17)			-0.8496	
Energy consumption per	0.3386	-0.6821		1.1608(x17)
capita(x18)			1.0207	
Diesel	0.1817	-0.0884		0.1531(x17)
consumption(x19)			0.2701	

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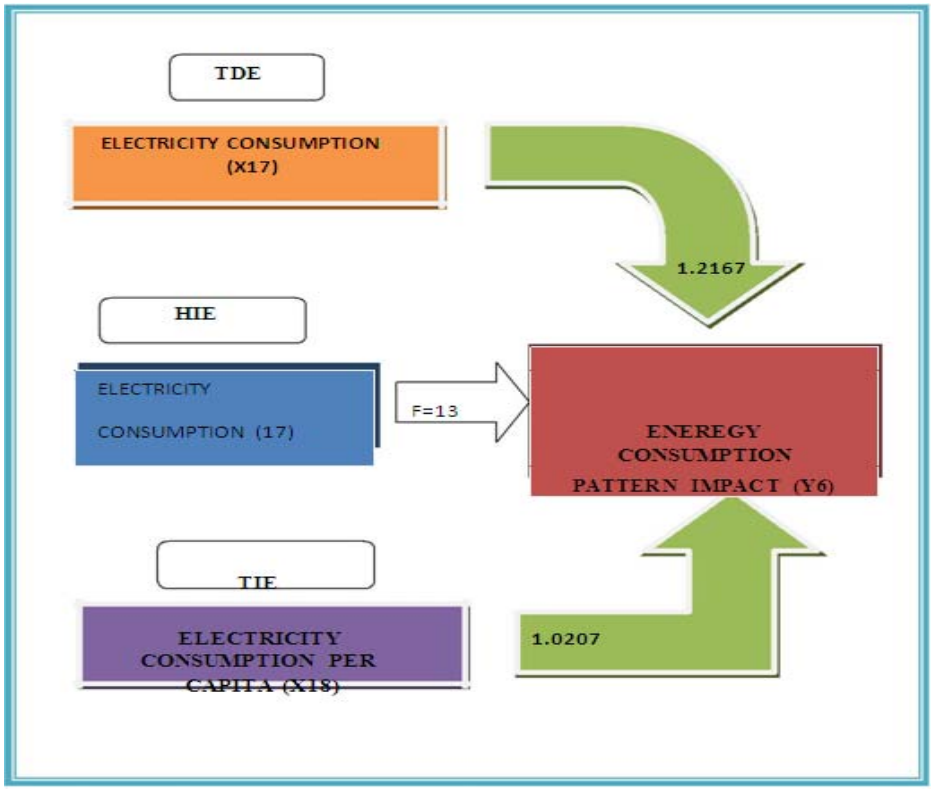
Consumption of	0.2381	-0.1776		0.7158(x17)
LPG(x20)			0.4157	
Consumption of	0.2000	-0.0768		0.0506(x13)
kerosene(x21)			0.2768	
Media	-0.1798	-0.1301		0.3386(x17)
responsiveness(x22)			-0.0497	
Decision matrix(x23)	0.0667	0.1058	-0.0391	0.1596(x17)

Residual Effect-0.4530

Model 18



Results

Table presents the Path Analysis where in the total effect of exogenous variables on consequent variable has been decomposed into Direct, Indirect and Residual effects. It has been evinced that variable electricity consumption (x17) has exerted highest direct effect (1.2167) and also the variable electricity consumption(x17) as highest total indirect effect (1.02078).

Revelation

Electricity consumption has substantially impacted on the Total Energy Balance, but with a positive value. The path analysis depicts the contribution electricity consumption at the domestic level has been dominant over other energy consumption. So, the farm families being relegated to dedicating power supply to run domestic power supply has also been the consumer of highest level farm energy as well

The variable electricity consumption (x17) has rented the highest indirect of as many as thirteen variables to prove its operational viscosity with other variables.

Table 17: Regression analysis Crop Energy Input (y1) vs 23 causal variables (x1-x23).

Variables	β	β X R	S. error	T Value	Rank
Age(x1)	-0.114	-2.382	56.757	0.505	XV
Education(x2)	-0.152	5.974	119.207	0.759	XI
Family size(x3)	-0.072	-1.039	622.541	0.162	XVIII
Male female ratio(x4)	-0.131	0.942	553.382	0.654	XIX
Occupation(x5)	-0.048	0.938	393.436	0.262	XX
Cropping intensity(x6)	-0.014	0.164	12.595	0.069	XXIII
Farm size (x7)	-0.412	13.607	978.620	1.273	IV
Homestead land(x8)	-0.280	6.525	410.080	1.364	X
Expenditure	0.059	1.531	0.044	0.183	XVII
allotment(x9)					
% of farming	0.499	30.657	33.853	1.940	I
expenditure(x10)					
Total income(x11)	0.298	6.779	0.019	1.150	IX
Irrigation index(x12)	-0.191	6.928	34.747	0.871	VIII
Economic	-0.628	9.560	459.000	2.414	VI
motivation(x13)					
Market orientation(x14)	0.424	-3.599	280.037	1.690	XIV
Labour engaged(x15)	-1.047	2.155	47.898	1.334	XVI
Average labour engaged	0.745	9.096	635.485	1.095	VII
per operation(x16)					
Electricity	1.500	23.923	3.330	1.058	II
consumption(x17)					
Energy consumption per	-1.298	-15.058	13.616	0.895	III

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capita(x18)						
Diesel consumption(x19)		0.319	13.369	0.058	0.896	V
Consumption	of	0.305	0.327	363.521	1.182	XXII
LPG(x20)						
Consumption	of	0.041	-0.591	17.951	0.210	XXI
kerosene(x21)						
Media		-0.362	-5.608	6.985	1.427	XII
responsiveness(x22)						
Decision matrix(x23)		-0.140	-4.198	957.386	0.475	XIII

=0.8575 F value =6.80 at 23 and 26 DFS

Result: The Multiple Regression Analysis reveals that the following three variables viz; per cent of farming expenditure(x10), electricity consumption(x17) and energy consumption per capita(x18) have exerted substantive impact on consequent variable, Total crop energy input (y1)

Revelation: It has been found that the causal variable per cent farming expenditure(x10) that is per cent of farming expenditure has contributed the highest percentile contribution to the total R^2 value. Expenditure is the most important indicator to estimate the value of input and type of input that are incurred in order to support the productivity and that is why the causal relationship standing that the higher the expenditure, the higher has been the crop energy input.

Subsequent to it the other causal variable is the x17 that is electricity consumption, so electricity consumption basically indicates the direct consumption of power in the form of pump operation, domestic electricity consumption etc. Certainly it contributes to crop energy input.

Table 18: Regression Analysis (Step down): Screening of variables having significant efficacy in impacting on Crop Energy Input (y1)

Variables			β		T
%	of	farming	0.316		2.310
expenditure(x10)					
Model Summery					
Model		R			Adjusted
1		0.3163		0.15	0.0813

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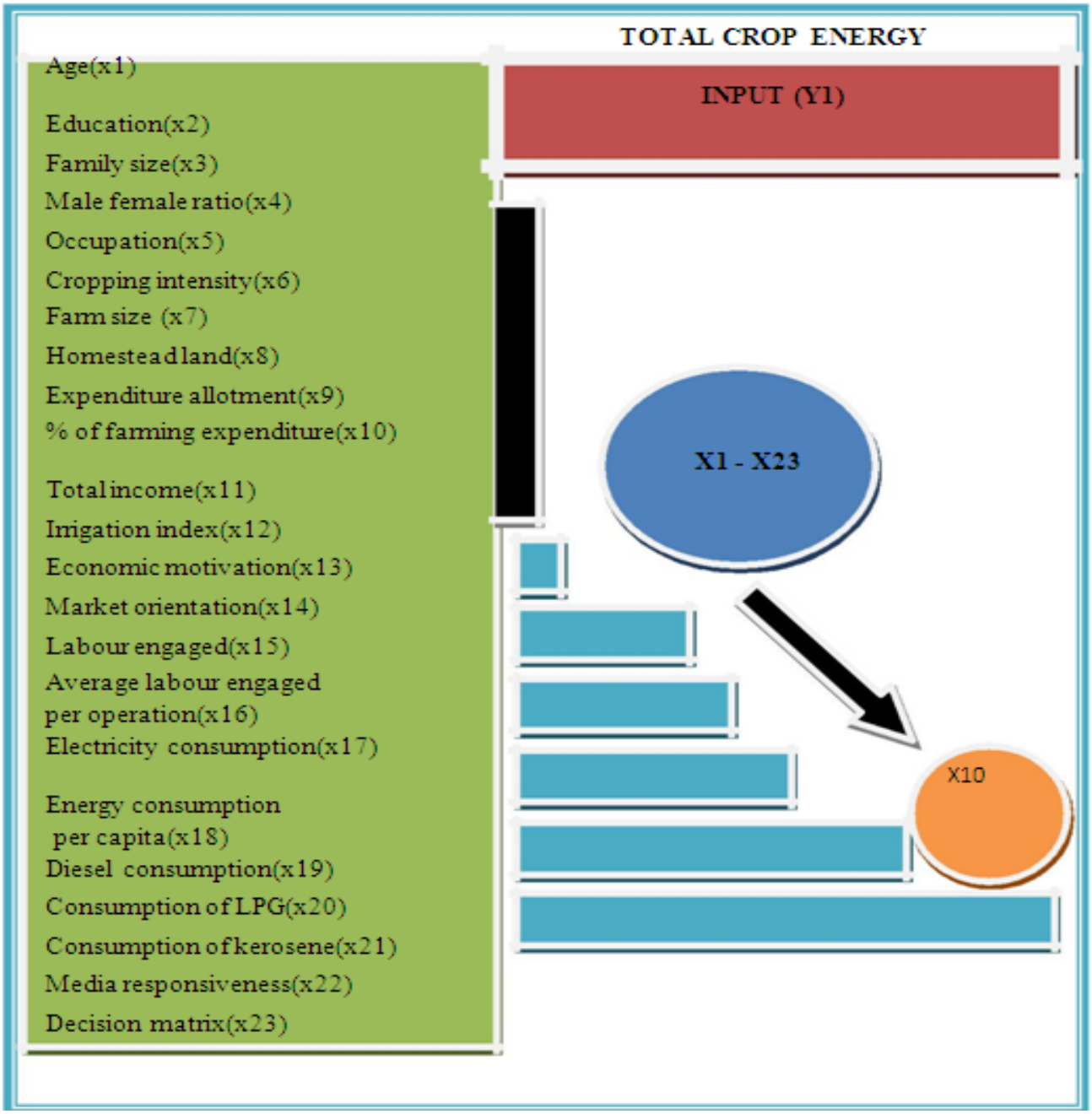
Model 7



Revelation: The step down regression analysis presents that at the last step of the variable per cent of farming expenditure(x10), and has contributed 15 per cent to crop energy input. The sources of energy are linearly related to family requirement which again is impacted by farming expenditure. Only per cent of farming expenditure(x10) has been retained at the last stage of Step-down Regression Analysis which has contributed 15.00 percent to the total R^2 value.

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Table 19: Regression analysis Crop Energy Output (y2) vs 23 causal variables (x1-x23)

Variables	B	β X R	S. error	T Value	Rank
Age(x1)	-0.038	0.011	244.829	0.311	XXII
Education(x2)	-0.174	0.206	514.222	1.606	XX
Family size(x3)	0.207	-3.924	2685.434	0.863	VII
Male female ratio(x4)	0.060	-1.180	2387.106	0.552	XIII
Occupation(x5)	0.043	-0.596	1697.154	0.432	XV
Cropping intensity(x6)	-0.057	1.923	54.329	0.521	XI
Farm size (x7)	-0.350	6.906	4221.441	1.995	V
Homestead land(x8)	-0.032	0.528	1768.948	0.290	XVII
Expenditure allotment(x9)	0.951	87.163	0.191	5.462	I
% of farming expenditure(x10)	-0.038	-1.695	146.029	0.273	XII
Total income(x11)	-0.057	-0.394	0.081	0.406	XVIII
Irrigation index(x12)	0.098	-2.894	149.888	0.822	VIII
Economic motivation(x13)	0.023	0.571	1979.974	0.163	XVI
Market orientation(x14)	-0.149	2.761	1207.986	1.096	IX
Labour engaged(x15)	0.694	-8.833	206.615	1.632	IV
Average labour engaged per operation(x16)	-0.671	5.782	2741.274	1.819	VI

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Electricity consumption(x17)		-0.976	-11.313	14.363	1.270	III
Energy consumption per capita(x18)		0.891	21.737	58.733	1.133	II
Diesel consumption(x19)		0.023	-0.320	0.252	0.118	XIX
Consumption of LPG(x20)		-0.100	2.474	1568.111	0.718	X
Consumption of kerosene(x21)		-0.085	0.889	77.436	0.799	XIV
Media responsiveness(x22)		-0.013	0.193	30.131	0.097	XXI
Decision matrix(x23)		-0.023	0.004	41.846	0.146	XXIII

=0.7148 F value =2.83 at 23 and 26 DFS

Result: The Multiple Regression Analysis reveals that the following three variables viz; expenditure allotment(x9), energy consumption per capita(x18) and electricity consumption(x17) have exerted substantive impact on consequent variable, Total crop energy output (y2)

Revelation: It has been found that the causal variable x9, that is, per cent of expenditure allotment, has contributed the highest percentile contribution to the total R^2 value. Expenditure is the most important indicator to estimate the value of input and type of input are incurred in order to support the productivity, that is the causal relationship standing out that the higher is expenditure the higher has been the crop energy output.

Subsequent to it the other causal is the (x18) that is energy consumption per capita, so electricity consumption basically indicates the direct consumption of power in the form of pump operation, domestic electricity consumption etc. Certainly it contributes to crop energy output.

Table 20: Regression Analysis (Step down): Screening of variables having significant efficacy in impacting on Crop Energy Input (y2)

Variables	β	t
Education (x2)	-0.165	2.333
Family size(x3)	0.359	2.288
Farm size(x7)	-0.380	3.947
Farm size per capita(x9)	0.917	10.120
Labour engaged(x15)	0.669	2.399
Average labour engaged per operation (x16)	-0.686	2.639
Electricity	-1.311	2.398

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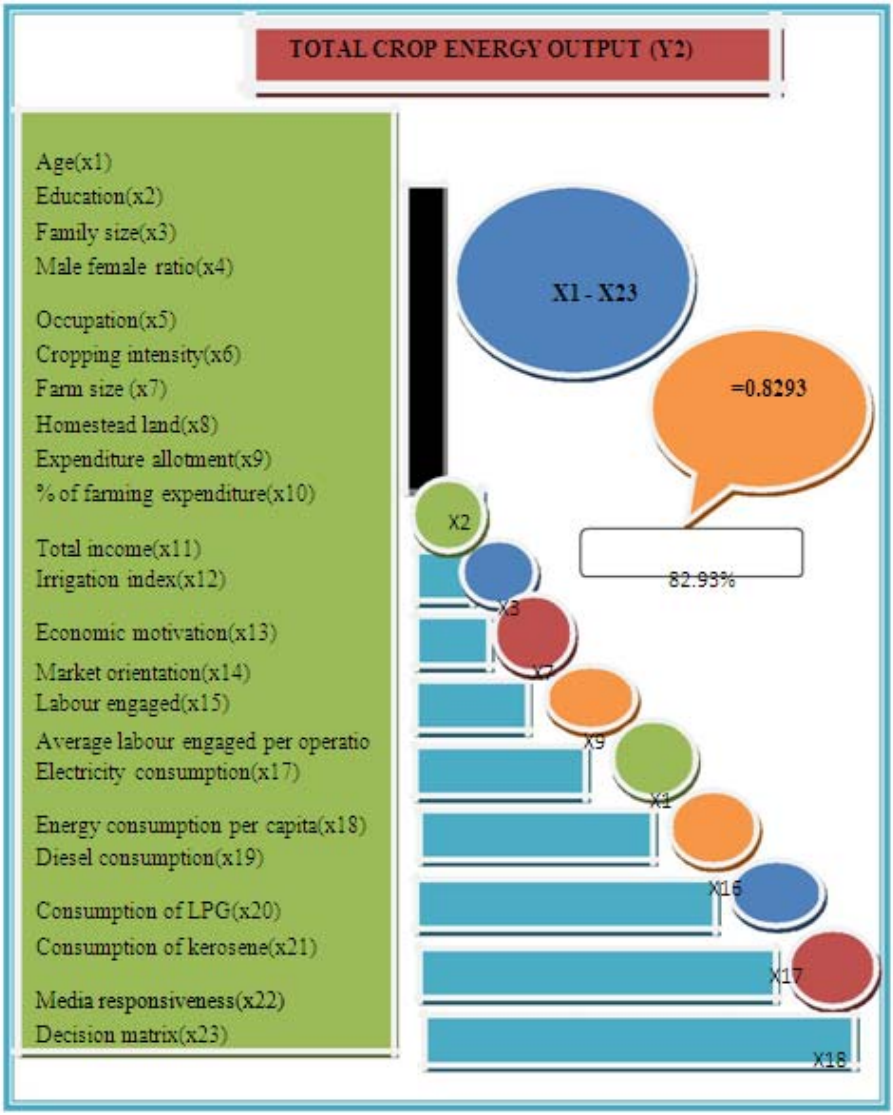
consumption(x17)						
Energy	consumption per		1.214		2.121	
capita(x18)						
Model Summery						
Model		R				Adjusted
1		0.9107		0.8293		0.7960

Model 8



Results: The step down regression analysis has retained eight prominent causal variables viz; energy consumption per capita(x18), electricity consumption(x17), average labour engaged per operation(x16), age(x1), expenditure allotment(x9), farm size(x7), family size(x3) and Education(x2), at the first step. So, these variables have got substantive strategic and operational impact on Total Crop Energy Output (y2).

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Revelation: The step down regression presents that eight prominent variables have contributed 82.93% to Total Crop Energy Output (y2). Education makes farmer aware of the different inputs used for farms, crops as well as home so that the output of farms, crops as well as, the health and hygiene of family members maintains an equilibrium with the ecosystem, energy consumption per capita(x18), electricity consumption(x17), average labour engaged per operation(x16), age(x1), expenditure allotment(x9), farm size4(x7), family size(x3) and Education(x2) have been retained at the following stage of Step-down Regression Analysis which has got cumulative contribution of 82.93 percent to the total R^2 value, i.e, to say that these variables deserve to earn a special attention while we intend to make a serious intervention in the domain of Total Crop energy Output.

Table 21: Regression analysis Total domestic Energy Consumption (y3) vs 23 causal variables (x1-x23).

Variables	β	β X R	S. error	T Value	Rank
Age(x1)	0.082	-0.068	75.197	0.474	XXII
Education(x2)	0.078	0.033	157.938	0.506	XXIII
Family size(x3)	-0.091	2.876	824.803	0.269	X
Male female ratio(x4)	-0.212	1.282	733.174	1.386	XIII
Occupation(x5)	-0.048	0.525	521.263	0.341	XX
Cropping intensity(x6)	0.308	-0.717	16.687	1.974	XVII
Farm size (x7)	0.301	6.855	1296.571	1.211	V
Homestead land(x8)	-0.075	0.591	543.314	0.480	XIX
Expenditure allotment(x9)	-0.025	-1.261	0.059	0.101	XIV
% of farming expenditure(x10)	0.382	21.337	44.851	1.938	II
Total income(x11)	0.016	-0.079	0.025	0.080	XXI
Irrigation index(x12)	-0.060	0.621	46.036	0.359	XVIII
Economic motivation(x13)	0.084	4.179	608.128	0.421	VII
Market orientation(x14)	0.144	3.482	371.020	0.750	VIII
Labour engaged(x15)	0.226	-1.005	63.460	0.377	XV
Average labour engaged per operation(x16)	-0.256	3.365	841.953	0.491	IX

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Electricity consumption(x17)	0.899	19.238	4.412	0.827	III
Energy consumption per capita(x18)	-0.195	-6.205	18.039	0.175	VI
Diesel consumption(x19)	-0.194	0.881	0.077	0.710	XVI
		89			
Consumption of LPG(x20)	-0.674	26.614	481.629	3.409	I
Consumption of kerosene(x21)	0.047	2.129	23.784	0.314	XI
Media responsiveness(x22)	-0.291	16.995	9.254	1.496	IV
Decision matrix(x23)	0.067	-1.668	1268.439	0.298	XII
=0.8565F value =6.75 at 23 and 26 DFS					

Result: The Multiple Regression Analysis reveals that the following three variables viz; consumption of LPG(x20), per cent of farming expenditure(x10) and electricity consumption (x17) have exerted substantive impact on consequent variable, Total domestic energy consumption (y3)

Revelation: It has been found that the causal variable x20, that is, consumption of LPG has contributed the highest percentile contribution to the total R^2 value. Consumption of LPG is the most important indicator to estimate the value of input and type of input are incurred in order to support the productivity, that is why the causal relationship stand that higher expenditure the higher has been the domestic energy input.

Subsequent other variable is the x10, that is, per cent of farming expenditure, so farming expenditure, basically indicates the direct expansion in the form of farming input. Certainly it contributes to domestic energy consumption.

Table 22: Regression Analysis (Step down): Screening of variables having significant efficacy in impacting on Crop Energy Input (y3)

Variables	β	T
Cropping intensity(x6)	0.218	2.141
%of farming expenditure(x10)	0.386	3.785
Electricity consumption(x17)	0.693	5.529
Consumption of LPG(x20)	-0.575	4.808
Media responsiveness(x22)	-0.418	3.995

Model Summery

Model	R		Adjusted
1	0.7701	0.5930	0.5467

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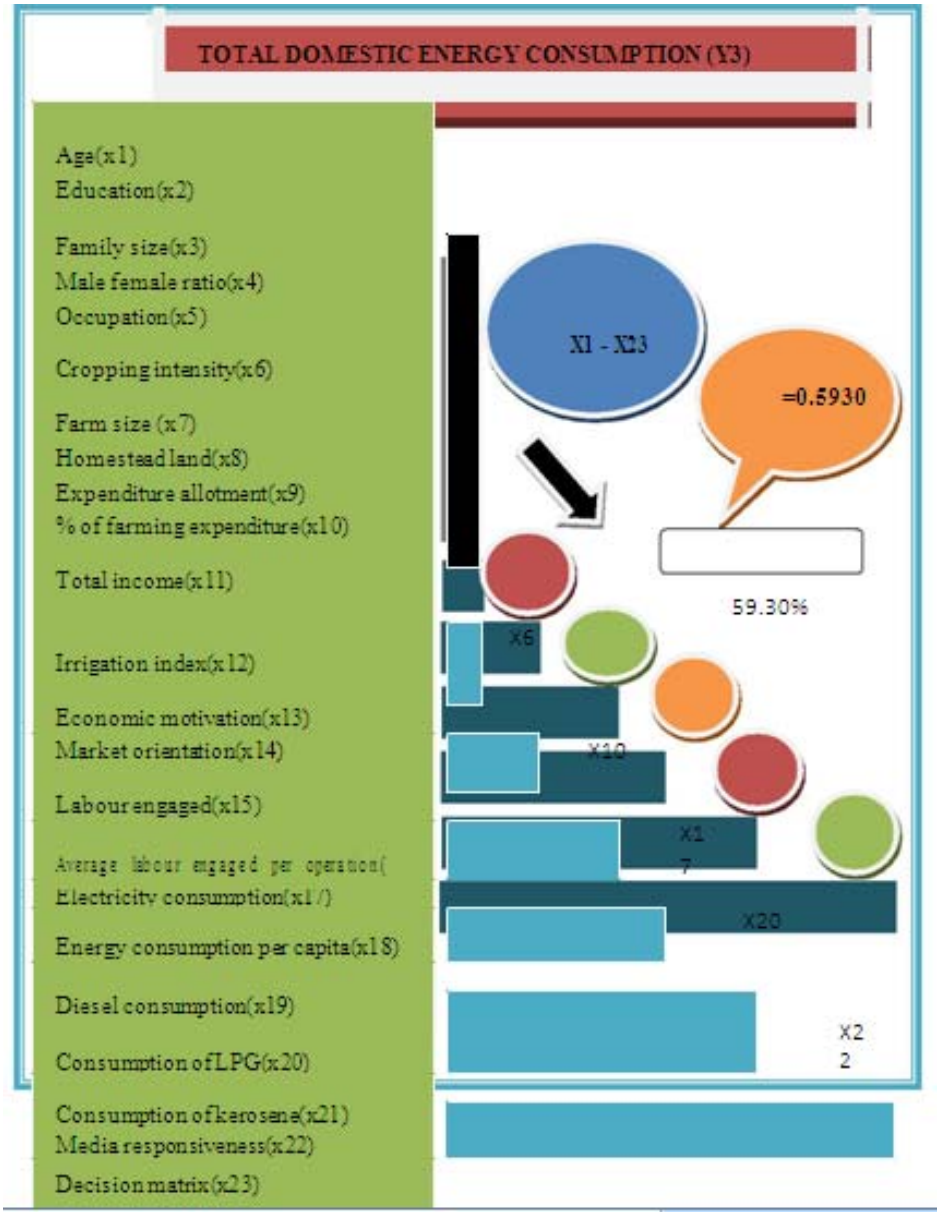
Model 9



Results: The step down regression analysis has retained five prominent causal variables viz; cropping intensity(x6), Per cent of farming expenditure(x10), age(x1), consumption of LPG(x20) and Education(x2), at the last step. So, these variables have got substantive strategic and operational impact on Domestic Energy Consumption

(y3).

Revelation: These variables have been retained at the following stage of Step-down

Regression Analysis which has got solitary contribution of 59.30 percent to the total

R^2 value, i.e, to say that these variables deserves to earn a special attention while we intend to make a serious intervention in the domain of Total Domestic Energy Consumption.

Table 23: Regression analysis Total Farm Residue Output (y4) vs 23 causal variables (x1-x23)

Variables	β	β X R	S. error	T Value	Rank
Age(x1)	0.039	-1.254	42.633	0.319	XIII
Education(x2)	0.019	-0.179	89.544	0.177	XX
Family size(x3)	0.130	-0.946	467.628	0.542	XIV
Male female ratio(x4)	0.093	0.117	415.679	0.851	XXI
Occupation(x5)	0.018	0.066	295.534	0.175	XXIII
Cropping intensity(x6)	0.244	6.168	9.461	2.210	V
Farm size (x7)	0.125	-4.066	735.101	0.709	VI
Homestead land(x8)	-0.114	2.930	308.036	1.026	VII
Expenditure allotment(x9)	-0.343	1.314	0.033	1.963	XI
% of farming expenditure(x10)	-0.061	2.416	25.429	0.435	VIII
Total income(x11)	-0.276	1.700	0.014	1.954	X
Irrigation index(x12)	-0.020	-0.352	26.101	0.167	XVIII
Economic motivation(x13)	-0.117	0.219	344.783	0.824	XIX
Market orientation(x14)	0.102	1.273	210.353	0.747	XII
Labour engaged(x15)	-2.742	88.606	35.979	6.427	I
Average labour engaged per operation(x16)	2.770	-35.930	477.352	7.482	IV
Electricity consumption(x17)	-1.058	-43.494	2.5.1	1.373	III
Energy consumption per capita(x18)	1.840	78.689	10.227	2.331	II
Diesel consumption(x19)	-0.057	0.737	0.044	0.295	XV
Consumption of LPG(x20)	-0.056	-0.685	273.063	0.400	XVI
Consumption of kerosene(x21)	-0.154	2.226	13.484	1.443	IX

Media			0.010	0.562	5.247	0.071	XVII
responsiveness(x22)							
Decision matrix(x23)			0.081	-0.117	719.151	0.509	XXII

=0.6916 F value =2.53 at 23 and 26 DFS

Result: The Multiple Regression Analysis reveals that the following three variables viz; Labour engaged(x15), energy consumption per capita(x18) and electricity consumption (x17) have exerted substantive impact on consequent variable, total farm residue output (y4)

Revelation: It has been found that the causal variable x15, that is, labour engaged has contributed the highest percentile contribution to the total R^2 value. Engagement of labour is the most important indicator to estimate the value of energy and type of energy that are incurred in order to support the productivity, that is, why the causal relationship stand that higher expenditure the higher has been the farm residue output.

Subsequent it the other variable is the x18, that is, energy consumption per capita, so energy consumption basically indicates the direct consumption of power in the form of pump operation, domestic electricity consumption etc. Certainly it contributes to farm residue output.

Table 24: Regression Analysis (Step down): Screening of variables having significant efficacy in impacting on farm residue output (y4)

Variables			**β**		**T**	
Cropping intensity(x6)			0.221		2.601	
Expenditure allotment(x9)			-0.413		4.157	
Total income(x11)			-0.250		2.615	
Labour engaged(x15)			-2.645		10.372	
Average labour engaged per						
operation(x16)			2.728		10.264	
Electricity			-0.752		2.410	
consumption(x17)						
Energy	consumption per		1.526		5.029	
capita(18)						
Model Summery						
Model		R				Adjusted
1		0.8934		0.7982		0.7645

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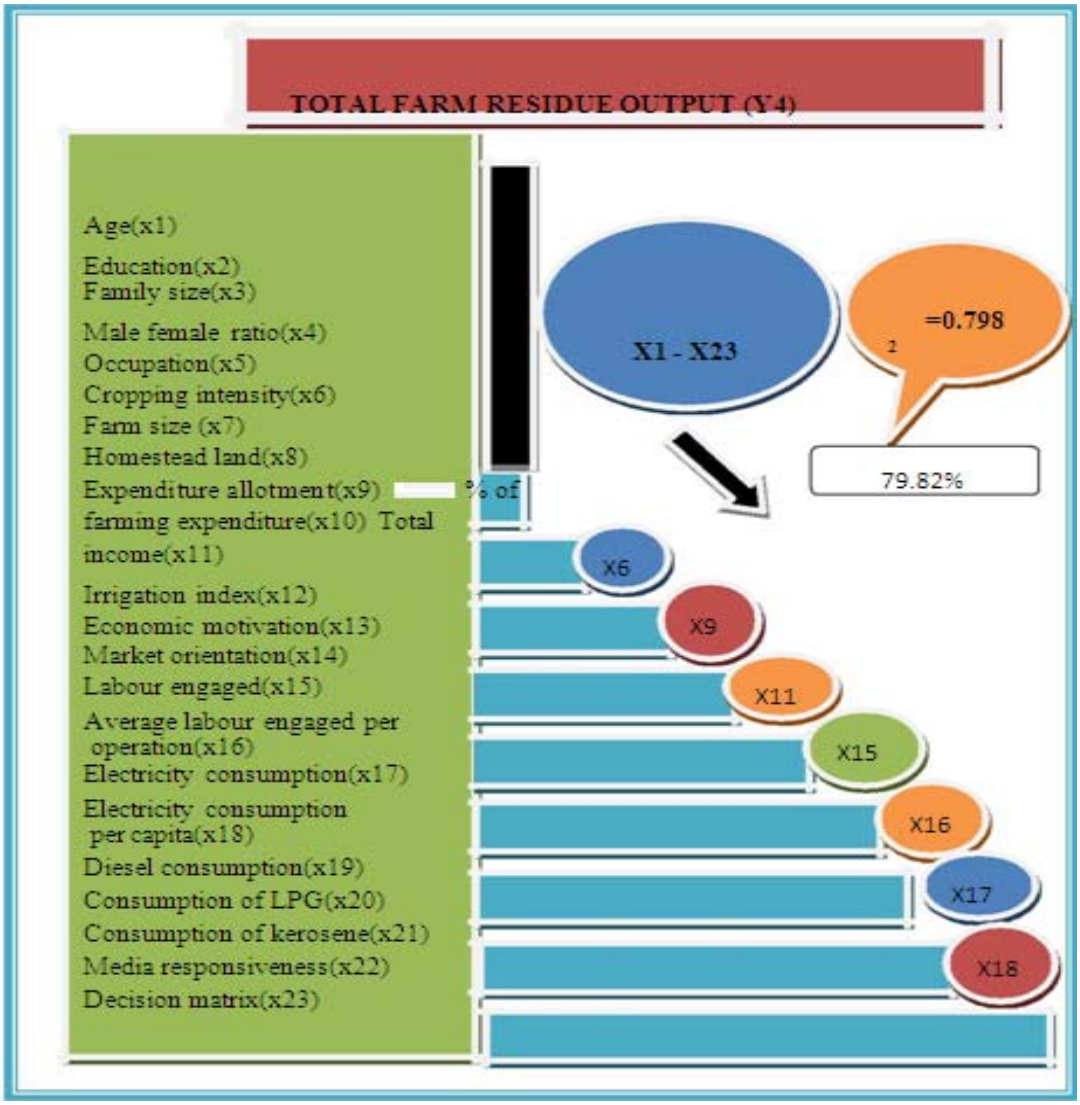
Model 10



Results: The step down regression analysis has retained seven prominent causal variables viz; cropping intensity(x6), expenditure allotment(x10), total income (x11), labour engaged(x215), average labour engaged per operation(x16), electricity consumption(x17) and energy consumption per capita (x18), at the last step. So, these variables have got substantive strategic and operational impact on Total Farm Residue Output (y4).

Revelation: These variables have been retained at the following stage of Step-down Regression Analysis which has got solitary contribution of 79.82 percent to the total R^2 value, i.e, to say that these variables deserve to earn a special attention while we intend to make a serious intervention in the domain of Total Farm residue output.

Table 25: Regression analysis Total Energy Balance (y5) vs 23 causal variables (x1-x23).

Variables		β	β X R	S. error	T Value	Rank
Age(x1)		0.071	-0.670	0.022	0.392	XVIII
Education(x2)		-0.202	1.452	0.046	1.264	XV

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Family size(x3)	0.113	-2.008	0.239	0.320	XIV
Male female ratio(x4)	0.108	-3.274	0.212	0.679	IX
Occupation(x5)	-0.004	0.052	0.151	0.029	XXI
Cropping intensity(x6)	-0.049	0.798	0.005	0.301	XVII
Farm size (x7)	-0.355	16.933	0.375	1.376	IV
Homestead land(x8)	-0.004	0.113	0.157	0.023	XIX
Expenditure allotment(x9)	0.813	67.395	0.000	3.171	I
% of farming	-0.220	-2.579	0.013	1.075	XI
expenditure(x10)					
Total income(x11)	-0.075	0.030	0.000	0.362	XXII
Irrigation index(x12)	0.217	-2.472	0.013	1.241	XII
Economic motivation(x13)	0.102	2.189	0.176	0.490	XIII
Market orientation(x14)	-0.203	4.446	0.107	1.016	VIII
Labour engaged(x15)	0.269	-10.911	0.018	0.429	V
Average labour engaged	-0.297	8.546	0.244	0.547	VI
per operation(x16)					
Electricity	-1.079	-23.300	0.001	0.954	III
consumption(x17)					
Energy consumption per	0.997	32.872	0.005	0.862	II
capita(x18)					
Diesel consumption(x19)	-0.043	1.386	0.000	0.151	XVI
Consumption of LPG(x20)	-0.004	0.057	0.139	0.018	XX
Consumption of	-0.110	2.686	0.007	0.704	X
kerosene(x21)					
Media responsiveness(x22)	0.212	6.210	0.003	1.047	VII
Decision matrix(x23)	-0.005	0.004	0.367	0.22	XXIII
=0.5470 F value =1.37 at 23 and 26 DFS					

Result: The Multiple Regression Analysis reveals that the following three variables viz; expenditure allotment(x9), energy consumption per capita(x18) and electricity consumption (x17) have exerted substantive impact on consequent variable, total energy balance (y5)

Revelation: It has been found that the causal variable x9, that is, expenditure allotment has contributed the highest percentile contribution to the total R^2 value. Expenditure is the most important indicator to estimate the value of input and type of input are incurred in order to support the productivity that is how the causal relationship stand that higher expenditure the higher has been the total energy balance.

Subsequent to other context is the x18, that is, energy consumption per capita, so energy consumption basically indicates the direct consumption of power in the form of pump operation, domestic electricity consumption etc. Certainly it contributes to farm residue output.

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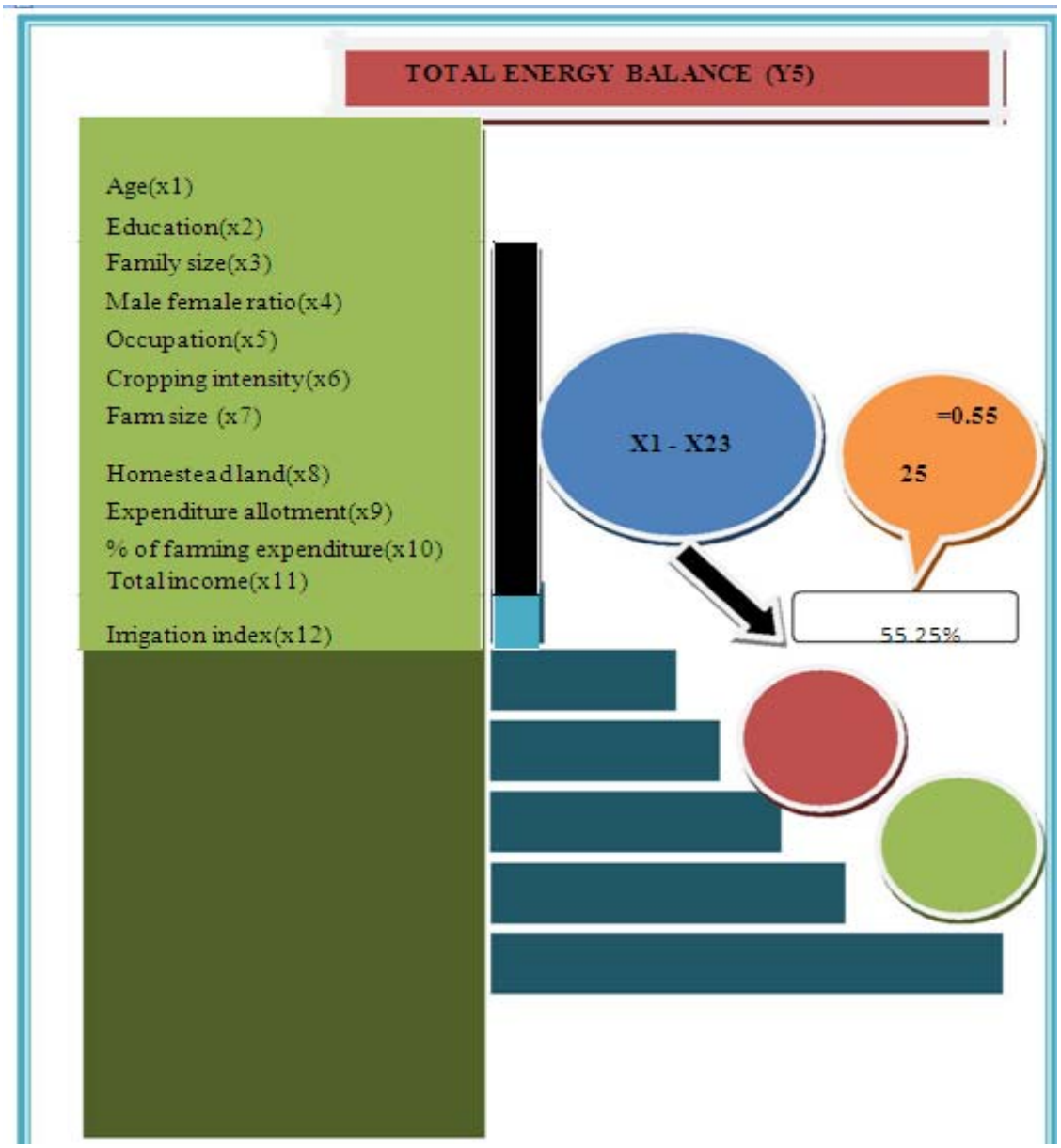
Table 26: Regression Analysis (Step down): Screening of variables having significant efficacy in impacting on Crop Energy Balance (y5)

Variables	β	t
Farm size(x7)	-0.485	4.844
Expenditure allotment(x9)	0.684	6.827

Model Summery

Model	R		Adjusted
1	0.7433	0.5525	0.5334

Model 11



Results: The step down regression analysis has retained two prominent causal variables viz; farm size(x7), and expenditure allotment at the last step. So, these variables have got substantive strategic and operational impact on Total energy balance (y5).

Revelation: The step down regression presents that at following step of step down analysis variable, has contributed the most to Total energy balance (y5). These variables have been retained at the following stage of Step-down Regression Analysis which has got solitary contribution of 55.25 percent to the total R^2 value, i.e, to say that these two variables deserve to earn a special attention while we intend to make a serious intervention in the domain of Total farm energy balance.

Table 27: Regression analysis Energy Consumption Pattern Impact (y6) vs 23 causal variables (x1-x23).

Variables	β	β X R	S. error	T Value	Rank
Age(x1)	0.247	2.096	0.130	1.129	XVI
Education(x2)	0.263	9.638	0.274	1.361	VI
Family size(x3)	-0.277	0.391	1.429	0.649	XX
Male female ratio(x4)	0.298	17.637	1.270	1.542	IV
Occupation(x5)	-0.024	-0.788	0.903	0.136	XIX
Cropping intensity(x6)	0.221	4.492	0.029	1.123	X
Farm size (x7)	-0.066	-1.926	2.246	0.210	XVII
Homestead land(x8)	0.044	0.010	0.941	0.224	XVIII
Expenditure allotment(x9)	-0.193	-5.011	0.000	0.623	VIII
% of farming expenditure(x10)	0.152	3.081	0.078	0.612	XIII
Total income(x11)	-0.026	-0.390	0.000	0.104	XXI
Irrigation index(x12)	-0.076	0.158	0.080	0.358	XXII
Economic motivation(x13)	0.454	34.706	1.053	1.805	III
Market orientation(x14)	-0.115	-4.523	0.643	0.473	IX
Labour engaged(x15)	0.478	12.542	0.110	0.630	V
Average labour engaged per operation(x16)	-0.341	-3.640	1.458	0.518	XII
Electricity	1.217	81.651	0.008	0.888	I

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consumption(x17)					
Energy consumption per capita(x18)	-0.682	-42.217	0.031	0.486	II
Diesel consumption(x19)	-0.088	-2.937	0.000	0.257	XIV
Consumption of LPG(x20)	-0.178	-7.728	0.834	0.713	VII
Consumption of kerosene(x21)	-0.077	-2.808	0.041	0.405	XV
Media responsiveness(x22)	-0.130	4.277	0.016	0.531	XI
Decision matrix(x23)	0.106	1.290	2.197	0.373	XVII

=0.3744 F value =9.18 at 3 and 46 DFS

Result: The Multiple Regression Analysis reveals that the following three variables viz; electricity consumption (x17), energy consumption per capita(x18) and economic motivation(x13) have exerted substantive impact on consequent variable, total domestic energy consumption pattern impact (y6)

Revelation: It has been found that the causal variable x17 that is electricity consumption has contributed the highest percentile contribution to the total R^2 value. Consumption of electricity is the most important indicator to estimate the value of input and type of input that are incurred in order to support the productivity.

Table 28: Regression Analysis (Step down): Screening of variables having significant efficacy in impacting on total domestic consumption pattern impact (y6)

Variables		β		T
Male female ratio(x4)		0.333		`2.807
Economic motivation(x13)		0413		3.462
Electricity consumption(x17)		0.256		2.137
Model Summery				
Model	R			Adjusted
1	0.6119		0.3744	0.3337

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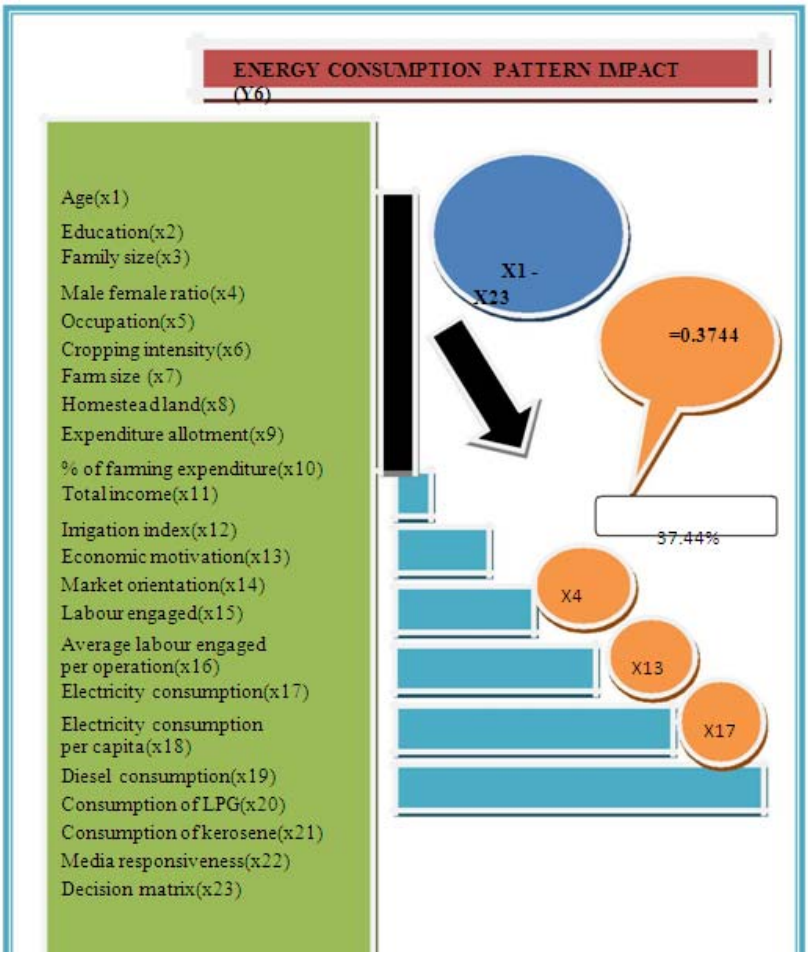
Model 12



Results: The step down regression analysis has retained three prominent causal variables viz;male female ratio(x4), economic motivation(x13) and electricity consumption(x17) at the last step. So, these variables have got substantive strategic and operational impact on total domestic energy consumption pattern impact (y6).

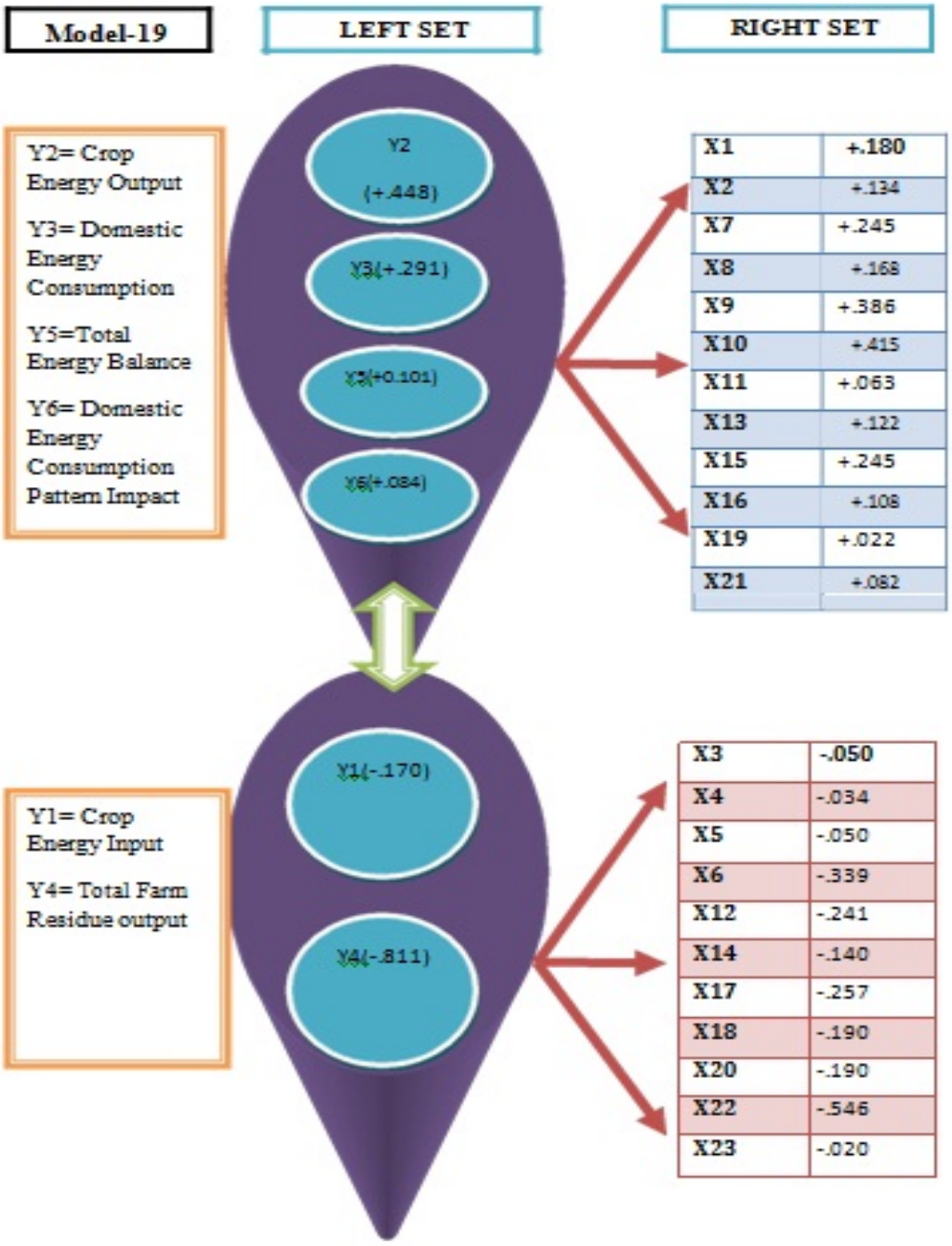
Y. CANONICAL COVARIATE ANALYSIS:

Two sets of variables (Y,X), have under gone canonical covariate analysis and the estimation of cross loading has been carried out. It has been found that the left set of variables (y) , y2, y3, y5, and y6, have moved together in the same direction. This four variables together have selected the following right set of variable viz; Age(x1), Education(x2), Farm size(x7), Homestead land(x8), Expenditure allotment(x9), Per cent of farming expenditure(x10), Total income(x11), Economic motivation(x13), Labour engaged(x15),Average labour engaged per operation(16), Diesel consumption(x19) and Consumption of kerosene(21) etc. And this indicates the crop energy balances y2, y3, y5, and y6 are strongly clung to each other and together they have selected the set of causal variables to have their close interaction.

Same as it has been found that it is from the left set of variable (y) , Y1 and Y4, have moved together in the same direction. This two variables together have selected the following right set of variable viz; family size(x3), male female ratio(x4), Occupation(x5), Cropping intensity(x6), Irrigation

index(x12), Market orientation(x14), Electricity consumption(x17), Energy consumption per capita(x18), Consumption of LPG(x20), Media Responsiveness(x22) and Decision matrix(x23) etc. This indicates that the crop energy balances y1 and total residue output y4 are strongly clung to each other and together they have selected for their close interaction, the set of exogenous variables from the right set.

Canonical covariate analysis here has clearly depicted those y variables have got a stragelic and clandestine combination to organize this entire cause-effect relationship.



Z.THE EMPIRICAL CONGLOMERATION OF OPERATING VARIABLES

Table 34: Factor analysis conglomeration of 23 independent variables (x1 t0x23)

Factor	Variables	% of variance	Cumulative %	Rename
1	Total income(x11)	19.803	19.803	Humane energy source
	Labour engaged(x15)			
	Average labour engaged per operation(x16)			
2	Electricity consumption(x17)	11.558	31.360	Conventional energy capsule
	Energy consumption per capita(x18)			
	Consumption of LPG(x20)			
3	Occupation(x5)	10.791	42.151	farm-eco system
	Cropping intensity(x6)			
	Expenditure allotment(x9)			
	Irrigation index(x12)			
4	Diesel consumption(x19)	9.510	51.661	Fuel – mobility
	Decision matrix(x23)			
5	Economic motivation(x13)	4.476	59.137	Media economy
	Media responsiveness(x22)			
6	Age(x1)	7.084	66.221	Family resource
	Family size(x3)			
7	Male-female ratio(x4)	5.251	71.471	Gender economy
	Market orientation(x14)			
8	Education(x2)	4.850	76.322	Education-

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	Consumption	of				fuel	
	kerosene(x21)						
9	Homestead land(x8)		4.417		80.738		

REVELATION

The factor analysis shows that the 23 variables contributing to and characterizing with the farm energy metabolism can be conglomerated into nine factors (1-9).

The Factor 1 has included following 3 number of variables i.e which have contributed 19.803% of variance and has been renamed as **Human Energy source**.

The Factor 2 has included three variables i.e. electricity consumption(x17), energy consumption per capita(x18) that have contributed 11.558% of variance has been renamed as **Conventional Energy Capsule**.

The Factor 3 has included four variables i.e. occupation (x5), Cropping intensity(x6), expenditure allotment(x9) and irrigation index which have contributed 10.791% of variance and has been renamed as **Farm Eco System**.

Factor 4 has include two variables i.e. diesel consumption(x19), decision matrix(x23) and Economic motivation(x13) which have contributed 9.510% of variance and has been renamed as **Fuel Mobility.**

The Factor 5 has included two variables i.e. economic motivations (x13), media responsiveness(x22), which have contributed 4.476% of variance and has been renamed as **Media Economy.**

The Factor 6 has included four variables i.e. age (x5), and family size(x3), which have contributed 7.084% of variance and has been renamed as **Family Resource.**

The Factor 7 has included two variables i.e. male female ratios (x4), market orientation(x14) which have contributed 5.251% of variance and has been renamed as **Gender Economy.**

The Factor 8 has included two variables i.e. education (x2), consumption of kerosene(x14) which have contributed 4.850% of variance and has been renamed as **Education-Fuel.**

Factor 9 has been unchanged, as it contains only a single variable i.e. homestead land(x8) which have contributed 4.417 of variance.

Summary and Conclusion

Today we all have some basic knowledge about the uses and application of energy. We know that by burning petrol or diesel we get energy to run scooters, cars, trucks, etc., and we also know that many of our homes need coal, kerosene, oil and gas for the supply for energy for cooking food and similar other domestic activities. For many of us, the awareness of energy has also come about through day-to-day inconveniences caused by power cuts, shortage of kerosene and diesel; fuel rationing, and the increasing cost of obtaining energy. For scientists, energy is in fact another form of matter and interchangeable with it. We live a world with energy all around us. Farm energy metabolism aims to explain the transfer of energy from one form to another in between the social system, ecological system, animate system as well as inanimate system and provide a deep insight into the domain of entropy generated during this transfer in nature between different tropic.

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Research Setting

The village Ghoragachha under Chakadaha block, in district of Nadia, West Bengal, was selected purposively and a total number of 50 respondents were selected by simple random sampling method. The independent variables selected for the study were Age (x1), Education (x2), Family size (x3), male female ratio (x4), Occupation (x5), Cropping Intensity (x6), Farm size (x7),), Homestead land size (x8), Expenditure allotment (x9), Per cent of farm expenditure (x10), Total income (x11), Irrigation index(x12) Economic motivation (x13), Market orientation (x14), Labour engaged(x15), Average labour engaged per operation(16), Electricity consumption(x17), Energy consumption per capita(x18), Diesel consumption(x19), Consumption of LPG(x20), Consumption of kerosene(x21), Media Responsiveness(x22), Decision Matrix(x23) while six dependent variables selected for the study were Cattle Total crop energy input (y1),Total Crop Energy output (y2), Domestic Energy Consumption (y3),Total farm residue output (y4), Total energy balance(y5), Energy Consumption Pattern Impact (y6).

Research Methodology

After collection of data, data were processed and analyzed in accordance with the outline laid down for the purpose at the time of developing the research plan. Process implies editing, coding, classification and tabulation of collected data. The main statistical tools and techniques used in the present study are as follows:

i. Mean
ii. Standard deviation
iii. Coefficient of Variance
iv. Correlation of coefficient
v. Multiple regression analysis
vi. Path analysis
vii. Factor analysis

Conclusion

The extension research of farm energy metabolism is extremely nascent; so, it is very difficult to identify and estimate the interaction of befitting variables in any given farm ecology. The variable interactions are very complex it encompasses a wide range of factor to be configured in a single model.

Present empirical study depicts that the energy metabolism in a given farm ecology is contributed all by a set of socio-economic, farm resource and agri-managerial variables. Starting from the expenditure allocation down to electricity consumption, for example, have become important predictors for this farm energy metabolism.

The extension policies must aim at creating a new competency in making the farms energy efficient and this can be done by creating awareness and imparting energy education, transforming the conventional energy intensive approach in ecologically responsive farm operation

All kind of transformation has got both process and product components, so the usher the farm with efficient energy metabolism must have to have better competency, effective models and appropriate analytical methodology. A series of newly bred variables can help in creating a new format for

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interacting and factor of production ultimately leading to a energy efficient farm and effective farm management with conserving and recycling of energy resources.

Limitation

The following limitation have been identified by the researcher.

1. No of relevant variables could have been increased.
2. This is a new type of extension research, the reference are not plenty.
3. Calculation of energy input and output could have been more reticulate.
4. Since, this is a very complex concept to a farmer, the responses were not forth coming

Future Scope

1. Farm energy auditing and its participatory monitoring
2. Energy conservation and recycling through more ecological use and planning of farm residues
3. Advanced extension methodology for socialization of farm energy extension management and its modelling for specially fragmented holdings need a set of new variables and modelling therewith.