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Case Study

Determinants of Capital Formation in Agriculture: A Case Study of Dimapur District of Nagaland, India

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ABSTRACT

The formation of capital through investment in agriculture helps build up the stock of capital assets and resources that enable the farmers to utilize their resources, particularly land and labour, more efficiently. The present study includes a total sample of 200 farm households consisting of marginal, small, medium, and large farmers from Dimapur District of Nagaland, selected through a three-stage stratified sampling technique for the year 2020-21. Using multiple regression technique assessed the factors that affect the capital investment at the farm level. The coefficient of determinant (R^2) value reveals that the model as good fit. Many factors influence the formation of capital in agriculture, among which family income (in ₹), working members (in number), and cropping intensity (in %) have positive influence. Unlike popular studies, the operational holding (in acres) has shown negative influence. Further, the age and education of the head of a family show no influence. There is a pressing need for fundamental change in the strategy to raise the resources and income of the farmer and accordingly accelerate the pace of capital formation in agriculture through targeting investment in irrigation, land development, and other infrastructure development.

HIGHLIGHTS

- The share of investment in farm machinery and tools are essential components among the farmers.
- Through regression analysis, it was found that working members, total income and cropping intensity were significant factors positively influencing fixed capital formation at farm level.
- Unlike the popular studies, the operational holding (farm size) has shown negative influence on farm capital formation.

Keywords: Capital formation, Agriculture, Multiple linear regressions, Determinants

In the production process an increase in capital helps in the productive capacity of the resources, where investment is an essential step in capital formation. Capital formation in agriculture has a statistically significant impact on the agricultural exports and production in an economy (Pathania, 2013). The growth of tangible capital assets on the farm that enable farmers to go a long way in increasing the efficiency of productive efforts is referred to as capital formation in agriculture. Generally, the physical capital assets are those reproducible goods which can be used for long-term production in any sectoral activity, such as land development, buildings, machinery, equipment, etc. And thus, in order to augment the productive capacity of the economy by increasing the capital stock, investment plays a crucial role (Kulshrestha, 2000). The investment could be for maintaining capital assets or purchasing new capital. Accordingly, the formation of capital through investment in agriculture helps build up the stock of implements, tools, machinery,

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irrigation, etc., enabling the farmers to utilize their resources, particularly land and labor, more efficiently. At the farm level, continuous growth in capital assets is essential to increase production and productivity (Venkataramana *et al*. 2019). To reach the goal of "faster, sustainable, and more inclusive growth" envisioned by the 12th five-year plan, investment in agriculture must be increased (Gore and Shinde, 2014).

During the sixties, technological advancement popularly known as the green revolution has transformed the Indian agricultural sector by increasing productivity, through public and private investments in capital formation, in the form of infrastructure improvement and increased use of farm machinery, fertilizers, insecticides, pesticides, improved irrigation, and HYV seeds, although confined to only a few states, crops, regions, and farm size. However, the agricultural output has increased as a result of the "green revolution (Stepha, 2022). And thus, through the advancement in technology one of the significant transformations is that it somewhat helped Indian agriculture to make progress from a traditional to modern farming.

REVIEW OF LITERATURE

Capital formation is a critical component of agricultural growth and development. Public investment in agricultural capital formation induces farmers to increase their farm investment. Therefore, without adequate public investment, agriculture cannot make a substantial contribution to the economic development of the country (Gore & Shinde, 2014). The last decades have witnessed an intense debate in the country that capital formation in Indian agriculture has been stagnated. As per the official estimates of the Central Statistical Organization (CSO), the public sector capital formation in agriculture (including forestry and fishery) has been falling in absolute terms, and any increase in private capital formation in agriculture cannot make the overall picture very comfortable. Unnikrishnan and Kattookaran (2020) points out that based on the empirical evidence, it was clear that both public and private infrastructure investments have a significant impact on the economic growth of the country, but that private investment has the potential to boost economic growth more effectively than public investment. Murukannaiah (2006) considered increase in production and the growth rate in agriculture are positively influenced by the proportion of current output invested in capital asset. Thus, investment in capital formation, both public and private, is essential for increasing agricultural output and revenue, which reinforce each other.

In India, the agriculture and allied sectors has contributed considerably in the overall growth and development of the economy, especially in ensuring food security. Despite the Covid-19 shock, the performance of agriculture and allied sector show a resilient growth at 3.0 percent in 2021-22 as compared to 3.3 percent in 2020-2021. The share of Gross Capital Formation (GCF) in agriculture and allied sector relative to GVA of India at 2011-12constant prices, has shown a fluctuating trend which was declined from 17 percent in 2014-15 to 15.2 percent in 2019-20, thereafter rose to 16.9 percent in 2020-21 but then again declined to16.4 percent in 2021-22 (Agriculture Statistics at a glance, 2022). The fluctuations in GCF mainly arises from wide variations in private and public sector investment on agriculture and allied sectors, that private investment has increased from 7 percent in 2019-20 to 9.3 percent in 2020-21, while the public investment remains stagnant at 4.3 percent during the same period (*Economic Survey*, 2022-23). Recognizing the direct relationship between capital formation in agriculture and the rate of growth, a planned and targeted approach for increasing both public and private investment is required.

The discussions on the factors influencing farm-level capital formation have drawn attention of the economists since 1960's in the country. A variety of socioeconomic factors influence private agricultural investment. Joliya *et al*. (2017) study on determinants of capital formation in Agriculture in Hadoti Region of Rajasthan revealed that size of holding, income, cropping intensity, saving and family size were significant factors. Using the regression analysis, Saini and Kumar (2020) found that operational holding, credit availability and saving were positive determining factors that influence the investment level in Punjab agriculture, while the family type, educational level and cropping intensity were found to be non-significant. Senthilkumar (2017) points out that among the farm household's farmers have

a high propensity to invest and save and factors like age, educational level, size of the household, experience in farming and household income have a significant effect on the capacity to invest and save. Meher and Sharma (2010) revealed that land size, education level and institutional credit positively and significantly affect investment in agriculture. Akber and Paltasingh (2022) attempted to identify the determinants of farm-level investment in Indian agriculture and its variability by using the cross-sectional data from the Situational Assessment Survey of Agricultural Households-70th round of NSSO and adopting the three-stage _feasible generalized least square '(FGLS) method, found that land ownership positively and significantly affects farm-level investment. Farm size, credit, farmer 's age, irrigated land, awareness of MSP, non-farm investments, commercialization, and animal output are all positive and significantly affecting farm investment. The household size and consumption expenditure exert a negative impact.

Nagaland is primarily an agrarian state, located in the northeastern part of India. Around 60% of its working population engaged in agriculture and related activities. Due to hilly terrain, the traditional Jhum/Shifting cultivation continues to be the popular system of cultivation in the state. The cultivation is done mostly on rain fed without irrigation, which includes mixed cropping of cereals, pulses, oilseeds, vegetables, spices, and so on. The sectoral contribution of agriculture and allied sectors to Gross State Domestic Product (GSDP) in 2022-23 was 20.81. The growth rate of the sector is estimated to raise from a negative growth rate -20.78 percent in 2021-22 to 4.57 percent in 2022-23. As a result of state experiencing a drought like situation in 2021-22, the food grain production has decreased to 328.41 MT from 755.59 MT in 2020-21. Likewise, the total area under food grain production has also decreased significantly by about 43 percent i.e., from 344.33 hectares in 2020-21 to 197.82 hectares in 2021-22 (Nagaland Economic survey, 2022-23). Public expenditure on agriculture and allied activities in Nagaland as on 2019-20 was 918 crore and in 2020-21 it was 894 crores, where the Triennial (TE2019-20) average expenditure on agriculture and allied sectors per operational holding in Nagaland stands ₹ 37900 only (NABARD, 2021). Increased allocation of public investment in the sector along with improved agro-climatic condition will encourage private investment, which will bring in rapid growth of agriculture production, and farmers' income as well.

In the light of above discussion, the study aims to assess the farmers' socio-economic status and determine how these factors have influenced the capital formation in agriculture at household level. Moreover, suggests policies for strengthening the process of capital formation in agriculture.

METHODOLOGY

The focus of the study area is Dimapur district, which is one of the most developed districts in Nagaland. It has a total population of 3.78 lakh and has a total area of 927 Km2 with 222 recognized villages. The major crop grown in the district are rice, maize, tomato and pineapple.

Sample design and size: A three-stage stratified random sampling technique has been used for the selection of the blocks, villages, and the farmers from Dimapur district of Nagaland. In the first stage, Medziphema and Nuiland blocks were selected out of four Rural Development Blocks in the district. In the second stage, the survey included two villages from each selected block i.e., Tsiepama and Molvom villages from Medziphema block and Nihokhu and S. Hetoi from Nuiland block. In the third stage, a total sample of 200 farm households were selected, i.e., 50 farm households were selected at random from each village. The households in the sample were then categorically listed, according to the farm size, into four different groups namely, Marginal farmers, Small farmers, Medium farmers and Large farmers respectively.

Data Analysis: Multiple Regression technique was used to determine the factors affecting the level of farm fixed capital investment at the farm level.

The functional form of the Multiple Linear Regression Model is as follows:

$$Y_i = b_0 + \sum b_j X_{ij} + u_i \ (j = 1 \text{ to } 7)$$

Where the dependent variable Y = Farm fixed capital formation in agriculture (in ₹'000)

The 7 (seven) explanatory variables chosen in the model are, X_1= Educational level of the household

head (in year); X_2 = Age of the household head (in year); X_3 = Cropping intensity (in %); X_4 = Operational holding (in Acre); X_5 = Working population in farm (in number); X_6 = Family size (in number); X_7 = Total family income (in ₹'000)

Farm-level investment (Y) includes the investment cost on the followings:

- Farm machinery and implements.
- Farm buildings include cattle sheds, farmhouses, and godowns.
- Irrigation structures include digging and repairing wells and tube wells, constructing irrigation channels, purchasing pump sets, etc.
- Investment in livestock.
- Land development includes land reclamation, leveling, bunding, fencing, land preparation, etc.

b_0 and b_j = Intercept and slope coefficients of the regression model, respectively.

u_i = Random disturbance term

The regression function was fitted separately for each farm size group, viz., marginal, small, medium, and large farms. The coefficient of multiple determinations (R^2) was calculated to know the model goodness of fit.

RESULTS AND DISCUSSION

Socio-economic Profile

The literature pointed out that many socio-economic factors influence investment in farm capital formation. Of these, the current study considered seven factors, on which the primary data were collected and analyzed their influence on farmers' investment in capital formation. The general characteristics of the respondents are shown in Table 1.

The educational profile depicts very few farmers were illiterate but majority were less educated (primary to high school level with 77.5%), while HSS (11.5%) and above HSS (2.5 %) level were also low. Amongst the marginal farmers, 17.08% were illiterate, primary and high school together constituted 68.29%, while 14.63% were HSS level, and none were above HSS level. Whereas, among large farmers, the proportion of HSS and above together constituted 54.54%, and none were illiterate. The data shows that large farmers were relatively more educated than small farmers.

Table 1: Socio-economic Characteristics of the Sample Populations in Dimapur District

Sl. No	Particulars	Farm Size				
		Marginal (N=41)	Small (N=79)	Medium (N=69)	Large (N=11)	All size (N=200)
1	Education					
	i. Illiterate	17.08	8.86	4.35	0	8.5
	ii. Primary	39.02	39.24	36.23	27.28	39
	iii. High school	29.27	44.30	43.48	18.18	38.5
	iv. Higher Secondary School (HSS)	14.63	5.06	14.49	36.36	11.5
	v. Above HSS	0	2.53	1.45	18.18	2.5
2	Age of the household head (in years)	49.37	46.95	49.81	50.45	48.63
3	Operational holding (in acre)	1.48	3.42	6.33	10.96	4.44
4	Family size (in numbers)	4.9	4.43	4.48	5.36	4.6
5	Working population in the farm (in numbers)	3.97	5.34	5.99	10.09	5.55
6	Cropping intensity (in %)	127.5	109.48	103.48	107.45	111.04

Source: *Computed from field survey, 2020-2021;* ***Note:*** *Marginal farmers: Operating upto 2.5 acres of land; small farmers: Having an operated areas between 2.51 to 5.0 acres of land; Medium farmers: Operating an area between 5.0 to 10 acres of land, large farmers: Whose operated area was more than 10.01 acres. See Kailas Sarap, 1991, Reddy, 1992.*

The average age of the household head is higher among the large farmers (51 years), while the lowest was for small farmers (47 years). For the total population in the sample, it was 49 years. Moreover, the average family size was 4.6 members per household. Large farmers have larger family sizes (5.36), followed by marginal (4.9), medium (4.48), and small farmers (4.43), respectively.

The overall average size of the holding was 4.44 acres per farm. For large farmers, it was 10.96 acres; medium farmers (6.33 acres), small farmers (3.42 acres), and marginal farmers (1.48 acres), respectively. The average working population per farm was 5.55 workers for total sample. For the large farmers, it was estimated at 10.09, medium (5.99), small (5.34), and marginal (3.97), respectively. The working population includes family labour together with permanent and attached labour involved in the farm operation. Further, the average cropping intensity in Dimapur district was 111.04 percent. Marginal farmers have the highest cropping intensity (127.5%), followed by small farmers (109.48%), large farmers (107.45%), and medium farmers (103.48%), respectively. It has been observed that smaller farms have higher tendency to increase cropping intensity than larger farms.

It is assumed that the larger the farm size, the higher is the investment opportunities for capital formation, especially on farm machinery and implements. Moreover, farmers with more working members on the farm have higher productivity. Working members on the farm is thus assumed a positive and significant factor in determining the capital formation in agriculture. The study further assumes that the household head's educational level and age factors may also positively influence the investment decision in the farm.

Family Income

Farmers' income plays a vital role in investment in capital assets. Farmers with higher income can have significant potential for saving and investment, whereas low-income farmers produce just enough for self-sustenance and thus restricts the choices for investment in agricultural capital formation. Table 2 represents the average annual income of the farmers from varied sources, such as crop production, other farm income, and non-farm income. Other farm income includes the income from the dairy and other livestock, plantation, sale of seeds and plants, wages from agricultural labor, income from hiring out of farm machinery and implements (including irrigation assets), etc. The non-farm income includes income from business, services, rent, etc. An attempt has been made to understand the levels and sources of income of the farm households in Dimapur district by farm size categories as presented in Table 2.

Table 2 shows the average family income for the overall sample households was ₹ 4,41,015.55 per annum. The income from non-farm sources constituted 38.17%, while farm income (crop production and other farm income) accounted for 61.83%. These proportions differ according to the

Table 2: Average Income of the farmers in Dimapur District (Rupees per annum)

Farm size	Crop income	Other farm income	Non-farm income	Total income
Marginal	87682.93	77082.93	190646.34	355412.20
	(24.67)	(21.69)	(53.64)	(100)
Small	152912.66	101565.19	143770.89	398248.74
	(38.30)	(25.50)	(36.10)	(100)
Medium	216289.13	112786.96	153579.71	482655.8
	(44.81)	(23.37)	(31.82)	(100)
Large	266545.45	185027.27	354454.55	806027.27
	(33.07)	(22.96)	(43.98)	(100)
All size	167655.30	105008.25	168352	441015.55
	(38.02)	(23.81)	(38.17)	(100)

Source: Computed from field survey 2020-21.

Figures in the parentheses represent percentage in respective farm category total income.

farm size; for marginal farmers, the income from non-farm sources was higher (53.64%) than that from farm activities (46.36%). On the other hand, for large farmers the income from farm activities (56.03%) was higher than non-farm income (43.38%). Further, as the farm size increases, the income from crop production tends to increase, while the non-farm income decreases with the farm size. The marginal farmland limits their farm income to sustain their livelihood, so they rely more on non-farm sources and vice versa for larger farms.

Fixed Capital Formation in Agriculture

Different categories of farmers have diverse inclinations to invest. Investment in formation of capital assets can be made in many items, such as the purchase of farm machinery and implements, farm buildings including cattle sheds, farmhouses and godowns, construction and purchase of irrigation structure, land development, etc., as per the needs of the individual farmer, the types of investment in farm physical capital may vary. The households' private investment in fixed capital formation by farm size categories is presented in Tables 3**.**

For all size, the total investment was ₹ 1,05,916.55 per farm household. Of the items, investment in farm machinery and implements was the highest, followed by livestock, farm buildings, land development, and the lowest was on irrigation structure.

Among the farm size categories, marginal farmers' total investment was way below with ₹ 62,072.20 per farm household. Out of its total investment, the highest was shared by livestock (30.55%) and the lowest was on irrigation structure (6.66%). Small and medium farmers' investment per farm was ₹ 97,906.84 and ₹ 1,31,043.50, respectively, with the highest share for machinery and farm implements (39.89% and 41.12%, respectively) and the lowest on irrigation structure (8.52% and 6.92%, respectively). For large farmers, investment per farm was ₹ 1,69,246.36, in which the share of farm machinery and tools was highest at 38.77%, and the least was on land development (13.91%). The results indicate that the percentage share of farm machinery and implements and irrigation structure in the total investment increased with the farm size categories, whereas the investment in the livestock and farm buildings tends to decline with an increase in the farm size categories. The investment in farm machinery and implements is an essential component in the production process, which share is higher than the others in all categories of farm, except for the marginal farm. The farm fixed capital formation per farm increases with the farm size. This is in agreement with the findings of Patel (1965) that in large farms, agricultural investment was income directed, whereas in small farms, it was subsistence and quick return oriented.

Table 3: Average Farm fixed capital formation (₹ per farm household)

Items of investment	Marginal	Small	Medium	Large	All size
Farm machinery and implements	16764.88	39058.73	53883.33	65610.00	41063.30
	(27.01)	(39.89)	(41.12)	(38.77)	(38.77)
Farm buildings	13673.17	18001.27	24285.51	31727.27	20037
	(22.03)	(18.39)	(18.53)	(18.75)	(18.92)
Irrigation structure	4134.15	8341.77	9072.46	23909.09	8587.50
	(6.66)	(8.52)	(6.92)	(14.13)	(8.11)
Livestock	18963.41	21387.34	26005.07	24454.55	22652.25
	(30.55)	(21.84)	(19.84)	(14.45)	(21.39)
Land development	8536.59	11117.72	17797.10	23545.45	13576.50
	(13.75)	(11.36)	(13.58)	(13.91)	(12.82)
Total	62072.20	97906.84	131043.50	169246.36	105916.55
	(100)	(100)	(100)	(100)	(100)

Source: *Field survey 2020-21.*

Figures in the parentheses represent percentage in respective farm category.

Determinants of Capital Formation in Agriculture

Various socioeconomic and personal characteristics influence investment in the formation of capital assets in agriculture. Based on the literature review, the study includes seven independent variables, namely educational level (in years), age of the household head (in years), cropping intensity (in %), operational holding (in acre), the working population in the farm (in number), family size (in number) and total family income (in ₹). The Multiple Linear Regression method was adopted to identify these factors relationship with investment in capital formation in agriculture. The regression analysis for all the categories of farm size is depicted in Table 4, where the overall reliability of the model is also tested. In Dimapur district, the multiple linear regression models for all the farm size categories were significant at 1 percent level as indicated by the F ratios, and the good fit of the models as revealed by the R^2 values were found to be more than 70 percent in all the farm size categories, which implies that the explanatory variables in the models explain more than 70 percent of the variations in the dependent variable.

Table 4 indicates that in the overall farm category in Dimapur district, the factors positively and significantly influenced capital formation were working population and total income, each significant at 1 percent and cropping intensity at 5 percent. Adding a working member to the family may increase capital formation by ₹ 11 thousand, and an increase in the total income by one thousand rupees will increase the capital formation by ₹ 429. Moreover, the impact of a 1 percent increase in cropping intensity will raise the capital formation by ₹ 503. On the other hand, operational holding and family size have negative influences, which are significant at 5% level, with the value of the regression coefficient -8.003 and -7.86. Contrasting the popular findings in the country, an additional acre of farm land (operational holding) and family size reduce the capital formation by ₹ 8000 and ₹ 7869 respectively. The education and age of the family head do not influence the farm's fixed capital investment in the study area.

Table 4: Determinants of Capital Formation in Dimapur District of Nagaland

Variables	Marginal farmers	Small farmers	Medium farmers	Large farmers	Overall
	Coefficient (β)	Coefficient (β)	Coefficient (β)	Coefficient (β)	Coefficient (β)
Constant	-123.158***	-227.949**	-376.269***	-347.241	-140.226***
	(2.43)	(2.49)	(2.86)	(0.54)	(3.03)
Edu (Years)	2.033	-2.105	-1.053	-26.852	-1.003
	(0.93)	(0.58)	(0.302)	(2.103)	(0.49)
Age (Years)	0.347	0.886	0.394	5.066	0.391
	(0.69)	(0.92)	(0.49)	(1.63)	(0.79)
CI (in %)	0.361**	1.252**	1.854*	3.514	0.503**
	(2.15)	(2.39)	(1.75)	(1.74)	(2.01)
OH (in acre)	17.825	-21.933	3.277	-41.348	-8.003**
	(1.59)	(1.43)	(0.28)	(1.68)	(2.43)
WPF (Number)	-3.872	13.441*	17.392**	27.793*	11.035***
	(0.80)	(1.96)	(2.42)	(2.87)	(2.89)
FS (Number)	2.916	-9.278*	-11.071*	-8.687*	-7.869**
	(0.88)	(1.69)	(1.83)	(2.85)	(2.52)
TI ('000 ₹)	0.233***	0.519***	0.474***	0.481**	0.429***
	(6.62)	(8.16)	(13.22)	(3.91)	(16.60)
	R^2= 0.74	R^2= 0.72	R^2= 0.81	R^2= 0.98	R^2=0.70
	F =13.74***	F=26.07***	F=37.54***	F= 40.05***	F=64.33***
	N=41	N=79	N=69	N=11	N=200

Note: Figures in the parentheses indicate t-value
****, **, & * indicate significance level at 1%, 5% and 10%, respectively.*
Edu: Education, CI: Cropping intensity, OH: Operational holding, WPF: Working population in the family, FS: Family size, TI: Total income.

By the farm size categories, for marginal farmers, the significant factors were cropping intensity and total family income (significant at 5 % & 1% levels, respectively), which coefficient values were positive (0.36 and 0.23, respectively) and thus capital formation increases by ₹ 361 and ₹ 233 as the cropping intensity rise by 1% and total family income by one thousand rupees, respectively. Other factors like education, age of the household head, operational holding, working population on the farm, and family size were insignificant. In the cases of small and marginal farmers, cropping intensity, working population, and total family income were positive and significant. For large farmers, the working population and total family income positively influenced capital formation in agriculture (significant at 10 percent and 5 percent levels, respectively). On the other hand, for small, medium, and large farmers, the family size with negative coefficients has depressed the capital formation in agriculture for the apparent reason.

As indicated in Table 4, the most crucial factor contributing significantly to the capital formation in Dimapur district was the annual family income for all the farm size categories. Moreover, cropping intensity and working population also positively influenced the investment for capital formation, while the farm size and family size reduce the fund available for investment, thus reducing capital formation. The age and education of the head of household showed no influence.

CONCLUSION

The need for capital formation enhances the pace and pattern of technological change and infrastructural development, positively affecting agricultural productivity. The study shows that the investment in fixed capital formation per farm is higher with large farmers than with small and marginal farmers. Item-wise, the largest share of investment per farm was in farm machinery and tools, while investment in irrigation and land development was lower than any other items. In the Dimapur district, among the factors that significantly influenced capital formation in the agriculture sector was total family income. Cropping intensity and working population on the farm have also shown positive influence, while the family size and farm size reduce the investment capacity of the farmers.

There is a pressing need for fundamental change in the strategy to raise the resources and income of the farmer and accordingly accelerate the pace of capital formation in agriculture through targeting investment in irrigation, land development, and other infrastructure. Public investment with a proper choice of project portfolio would be crucial for complementing private investment. The Government needs to create a conducive development support environment for private investment. There is also a need to encourage the banking sector to extend more investment credit to the agricultural sector, hence, accelerating the pace of investment that holds the key to providing a much-needed structural break and lifting the agriculture sector from the current state of stagnation. It calls for agricultural extension services to educate the farmers on the importance of capital asset formation and cropping intensity, allowing them to use their available resources more efficiently.

REFERENCES

Akber, N. and Paltasingh, K.R. 2022. Capital formation in Indian agriculture an empirical analysis. Shri Mata Vaishno Devi University. http://hdl.handle.net/10603/394077

GOI, Agricultural Statistics at a glance, 2022. Government of India, Ministry of Agriculture and Farmer welfare, Department of Agriculture and Farmers Welfare, Economics and Statistics Division. New Delhi.

GOI, Economic Survey 2022-23. Government of India, Ministry of Finance, Department of Economic Affairs, Economic Division, New Delhi, January 2023.

GON, Nagaland Economic Survey 2022-23. Department of Economic and Statistics, Government of Nagaland, Kohima.

Gore, Dnyaneshwar Vishnu and Neeta Dnyandeo Shinde (2014). An Analysis of Capital Formation in Indian Agriculture and ITS Implications for More Inclusive Growth of Indian Economy. *J Poverty, Investment and Development*, **6**(1).

Joliya, P., Kamalvanshi, V., Kushwaha, S. and Shilpi. 2017. Determinants of capital formation in Agriculture: Hadoti Region of Rajasthan, India. *Int. J. Curr. Microb. and Appl. Sci.*, **6**(7): 4239-4245.

Kulshrestha, U.C. 2000. Economic Development and planning. Lakshmi Narain Agarwal Publishers, Agra (UP).

Mahantesh, Y. 2012. An Economic analysis of private investment in dry land agriculture Ph.D. (Agri. Economics) Thesis. University of Agricultural Sciences, Dharwad.

Meher, S. and Sharma, R.K. 2010. Pattern of farm investment among cultivating households: a comparative study of

Haryana and Orissa. Jawaharlal Nehru University, New Delhi, India. http://hdl.handle.net/10603/31428

Murukannaiah, S. 2006. Capital formation in agriculture in Chitradurga district of Karnataka state an economic analysis. Unpublished M.Sc. (Agri.) Thesis, University of Agricultural Sciences, Dharwad.

NABARD- Farmers welfare in India: A state wise analysis. Department of Economic Analysis and Research, Mumbai, July 2021.

Pathania, R. 2013. Impact of capital formation on production and export: A case study of agriculture sector in India. *ACADEMICIA, An international Multi-disciplinary Res. J.*, **3**(6): 77-84.

Saini, R. and Kumar, R. 2020. Determining the factors affecting investment in Punjab Agriculture. *Econ. Aff.,* **65**(4): 511-520.

Senthilkumar, P. 2017. A study on investment pattern and awareness of farmers in Pollachi Thaluk. *Int. J. Interdisciplinary Research in arts and Humanities (IJIRAH),* **2**(1): 4-8.

Stepha, G.E.J. 2022. Impact of green revolution in India. *Int. J. Health Sci.,* **6**(S4): 5291-5297.

Unnikrishnan, N. and Kattookaran, T.P. 2020. Impact of public and private infrastructure investment on economic growth: evidence from India. *J. Infrastructure Dev., Sage J.,* **12**(2).