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## **Changing Agricultural Labour Market and Its Effects on Farm Economy in India**

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### ABSTRACT

The paper presents long-run changes in agricultural labour market and its effects on farm economy. Further, the effect of COVID-19 led disequilibrium in labour market on cost of cultivation of paddy and wheat has been quantified. The evidence from both census and NSSO surveys point out rising employment diversification towards non-farm sectors. Census estimates of agricultural labour are higher than NSSO estimates which is partly explained by adoption of different 'minor' time criteria by these sources to identify marginal/subsidiary labour. Census based evidences suggest distress-led transition of cultivators to agricultural labours, whereas NSSO surveys based evidences refute such trends and point out towards development-led employment diversification wherein both cultivators and agricultural labours move towards more productive non-farm sectors. The recent NSSO survey (2017-18) reveals deceleration in withdrawal of cultivators and acceleration in withdrawal of agricultural labours. Successive cost of cultivation surveys also report a consistent decline in labour use in crop cultivation and therefore externally validate the trends from NSSO surveys. However, despite reduction in labour use, labour cost has increased. Due to inelastic demand for labour, increase in wages could not bring proportionate decrease in labour use and resulted in increase in labour cost in crop cultivation. Short-term disequilibrium in labour supply caused due to COVID-19 led lockdown increased cost  $A_1+FL$  by 1.1 per cent in wheat and 4.6 per cent in paddy. However, farmers in Bihar did not witness any benefit on account of increased labour supply due to large scale reverse migration.

**Keywords:** Labour market, NSSO, Census, Farm economy, COVID-19.

**JEL:** E24, J43, O15, Q15,

### I

### INTRODUCTION

Structural change in the sectoral composition from agriculture to non-agricultural sectors is an important indicator of economic development. Like other countries, India is also witnessing such changes (Papola, 2012; Soni and Subrahmanya, 2020). This is evident from the declining share of the agriculture sector in national output and employment. Between 1972-73 and 2017-18, the share of agriculture in gross value added (GVA) and employment has declined by 24 and 30 percentage points, respectively. However, dependency of workforce on agriculture is still far higher than its contribution in GVA. Presently, 44.1 per cent of the workforce engaged in agriculture produces only 17 per cent of the output. Many scholars have argued to

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accelerate employment diversification towards more productive non-agricultural sectors (Kumar *et al.*, 2011; Himanshu *et al.* 2011; Chand *et al.* 2017).

Employment diversification, though desirable from economic development point of view, has definite implications on agriculture. The outward movement of agricultural labour creates labour scarcity for timely completion of farm operations, particularly during peak season. Further, contraction in labour supply if unaccompanied by reduction in its demand (through labour saving technologies) can lead to increase in wages and inflate labour cost. As labour constitutes a predominant share in production cost (Raghavan, 2008; Srivastava *et al.* 2017), increased wage bill can adversely affect farm profitability. Tracking long-run changes in labour supply in agriculture and assessing its effects on farm economy assume significant importance in formulating effective strategies for management of labour use in agriculture.

The unprecedented occurrence of COVID-19 pandemic has created disequilibrium in the rural labour market. The closure of non-essential economic activities due to imposition of lockdown to curb the virus infection forced a sizable number of migrant casual labours of urban areas to return to their native villages. Further, COVID-19 checked rural to rural movement of seasonal labours for performing farm jobs on contractual basis in the labour deficit states. Therefore, in few states size of rural labour force increased, whereas the states depending on seasonal labour faced labour scarcity for farm operation. It is pertinent to assess the differential effects of COVID-19 led short-run changes in labour supply on farm economy in labour-deficit and labour-surplus states.

In this context, the paper provides empirical evidences on temporal changes in agricultural labour supply based on alternative data sources and assesses its effects on the farm economy. Further, likely effects of COVID-19 led changes in labour supply on farm economy are predicted by analysing the existing structure of labour market. The specific objectives of the paper are; (1) to examine long-run trends in estimates of agricultural workforce from census and National Sample Survey Office (NSSO) surveys, (2) analyse the effects of withdrawal of agricultural labours on farm economy, and (3) evaluate differential effect of COVID-19 led changes in labour supply on farm economy in labour-deficit and labour-surplus states.

## II

### DATA AND METHODOLOGY

In India, census and NSSO surveys are the two primary sources of data on employment. Census, which is conducted at decennial frequency, provides wide range of data on demographic and socio-economic characteristics of the Indian population. In census, persons engaged in economically productive activities for a major/minor part of the reference period, are classified as main/marginal workers. The latest available census data pertains to the reference year 2011. On the other hand, NSSO conducts household surveys on employment and unemployment issues

at the interval of five years to enquire about multi-dimensional characteristics of participation of labour force in different economic activities and to provide estimates of various indicators of employment structure at the national and state-level. The latest available quinquennial NSSO data on employment pertain to the reference year 2017-18. In the present study, the estimates on agricultural workforce from both census and NSSO surveys are compared and long-run trends (1993-94 to 2017-18) in employment in agriculture sector have been analysed.

Further, macro-level trends in agricultural workforce have been cross-examined using the estimates from farm-level cost of cultivation (COC) surveys of Directorate of Economics and Statistics, Government of India. For this, an aggregate time series of labour use (family and hired) was constructed using COC summary data on ten principal crops in 19 states. The selected crops include paddy, wheat, maize, jowar, gram, arhar, rapeseed & mustard, groundnut, sugarcane, and cotton which covered 64.58 per cent of the gross cropped area (GCA) in the country in 2015-16. The area cultivated under each crop in the respective state was used as weight to construct aggregate time series. Additionally, aggregate time series were also constructed for the variables, namely labour cost, cost  $A_1+FL^1$  and return from the cultivation of these crops to observe the general trends in farm economy in correspondence with changing labour use. Cost and returns were expressed in real terms using Consumer Price Index for Agricultural Labour (2004-05=100).

The decline in labour use in agriculture may have positive or negative effect on the cost of cultivation depending on the associated changes in wages. The inter-relationships among these variables have been established by estimating price elasticity of labour using plot-level COC data for the period 2000-01 to 2016-17. It is hypothesised that changes in labour supply will influence the prevailing wage rates and its effect on cost of cultivation can be ascertained using estimated elasticity coefficients. Following Srivastava *et al.* (2017), the elasticity coefficients were estimated at the national level by fitting the transcendental logarithmic (translog) cost function in ten crops.

To evaluate the differential effect of changes in labour supply due to COVID-19 on farm economy in labour-surplus and labour deficit states, separate models were fitted for Punjab (labour-deficit state) and Bihar (labour-surplus state) in paddy and wheat crops and elasticity coefficients were estimated. Further, field level observations were reported on the change in prevailing wage rates during April-June 2020 as compared to the previous year in Bihar and Punjab for selected farm operations. Using the estimated elasticities and average change in wage rates, the effect of change in labour supply due to COVID-19 on farm economy is assessed and its implications are discussed.

## III

## RESULTS AND DISCUSSION

*Comparison of Census and NSSO Estimates of Agricultural Workforce*

Both Census and NSSO provide the estimates of employment in India. It is pertinent to compare the estimates from these two different sources and see how close data correspond to each other. Gender and occupation category wise disaggregated data on agricultural workforce participation rate (AGWPR) from large NSSO rounds and closest census years are presented in Table 1. For the comparison, it is essential that both sources follow similar concepts and have the same reference period. Census as well as NSSO follow the same definition to identify a worker – a person engaged in ‘economic activity’ during a reference period. Both sources use a reference period of one year and the set of production related activities accepted as ‘economic activities’ are almost the same (Kasturi, 2015). Further, in order to account more than one economic activities performed by a worker during the reference year, census (as well as NSSO) provide count of ‘main’ (‘principal activity’) and ‘marginal’ (subsidiary activity) workers using ‘major’ and ‘minor’ time spent criteria on performing an activity, respectively. ‘Major’ time spent criteria (6 months or more during the reference year) used in both sources is the same. However, there is a difference in the ‘minor’ time criteria adopted by census and NSSO while identifying marginal (subsidiary status) worker. Those who have worked less than six months in

TABLE 1. CHANGES IN THE AGRICULTURE WORKFORCE PARTICIPATION  
BASED ON CENSUS AND NSSO SURVEYS

		<i>(per cent)</i>							
Sector (1)	Gender (2)	Census		NSSO		Ratio of NSSO over census		Percentage point change between 2001 and 2011	
		2001 (3)	2011 (4)	2004-05 (5)	2011-12 (6)	2001 (7)	2011 (8)	Census (9)	NSS (10)
Population (crore)	Male	53	62	-	-	-	-	-	-
	Female	50	59	-	-	-	-	-	-
	Person	103	121	-	-	-	-	-	-
All workers	Male	51.7	53.3	54.7	54.4	1.06	1.02	1.6	-0.3
	Female	25.6	25.5	28.7	21.9	1.12	0.86	-0.1	-6.8
	Person	39.1	39.8	42.0	38.6	1.07	0.97	0.7	-3.4
Ag. workers	Male	28.3	27.7	27.8	23.7	0.98	0.86	-0.6	-4.1
	Female	19.6	17.4	21.2	13.7	1.08	0.79	-2.2	-7.5
	Person	24.1	22.7	24.6	18.9	1.02	0.83	-1.4	-5.7
Cultivator	Male	16.1	13.3	16.4	14.4	1.02	1.08	-2.8	-2.0
	Female	8.4	6.1	9.9	6.9	1.18	1.13	-2.3	-3.0
	Person	12.4	9.8	13.3	10.7	1.07	1.09	-2.6	-2.6
Ag. labour	Male	10.8	13.3	9.3	7.3	0.86	0.55	2.5	-2.0
	Female	10.0	10.5	7.2	4.6	0.72	0.44	0.5	-2.6
	Person	10.4	11.9	8.3	6.0	0.80	0.50	1.5	-2.3
Others Ag. workers*	Male	1.5	1.1	2.1	2.0	1.4	1.8	-0.4	-0.1
	Female	1.2	0.8	4.1	2.3	3.4	2.9	-0.4	-1.8
	Person	1.3	0.9	3.1	2.1	2.4	2.3	-0.4	-1.0

\*Plantation crops (tea, coffee, coconut), livestock, fisheries and forestry.

an economic activity during the reference year are counted as ‘marginal workers’ in census. On the other hand, NSSO provides subsidiary status (synonymous as ‘marginal worker’) to only those workers who have worked for at least 30 days to less than 6 months during the reference period. Thus, those working less than 30 days in a year in an economic activity are excluded from being counted as ‘subsidiary worker’ in NSSO surveys, but are counted as ‘marginal worker’ in census. This may be one source of deviation in the estimates from these sources, if any. Apart from this, the estimates could also partly vary due to differences in the geographical coverage and coverage of segments of the population (Choudhury and Mukherjee, 2008). Although magnitude of estimates may vary due to several sampling and non-sampling errors, both the sources shall provide a consistent trend in the employment. This aspect is empirically examined in the following sections.

According to 2004-05 NSSO employment survey, 24.6 per cent of India’s population (58.6 per cent of total workers) was engaged in agricultural activities (Table 1). This estimate is very close to the 2001 census estimate of 24.1 per cent. Both sources also reported predominance of cultivators (over agricultural labours) among the total agricultural workers in 2001/2004-05. Further, AGWPR declined between 2001/2004-05 and 2011/2011-12 in both census and NSS surveys. As the overall worker participation rate remained almost constant (in census) or declined at relatively slower rate (in NSSO surveys), declining AGWPR indicates a rising trend in employment diversification away from agriculture towards non-agricultural sectors. Several scholars have also observed rising employment diversification in the country and have provided plausible explanations (Mukhopadhyay and Rajaraman, 2007; Kumar *et al.*, 2011; Himanshu *et al.* 2011).

It is to be noted that the rate of decline in AGWPR was significantly higher in NSSO surveys (-5.7 per cent) as compared to census (-1.4 per cent). Disaggregation of agriculture workers revealed that it is primarily accounted by the wide variation and contrary trend in the estimates of agricultural labour from these sources. The 2001 census estimate of agricultural labour was 20 per cent higher than 2004-05 NSSO estimates. The subsequent 2011-12 NSSO survey reported 2.3 percentage points decline in the agricultural labour participation rate as compared to 1.5 percentage points increase in it in 2011 census. As the rate of decline in the participation of cultivators was uniform in census as well as NSSO surveys, contrary trend in agricultural labour explained the differential rate of decline in AGWPR between the two sources. The gap between census and NSSO estimate of agricultural labours widened to 50 per cent by the year 2011-12.

The share of main (principal status) workers in total agricultural workers was calculated to investigate whether adoption of different ‘minor’ time spent criteria in identifying marginal (subsidiary status) workers explains lack of correspondence in the estimates of census and NSSO surveys, particularly for agricultural labours (Table 2). The results reveal that more than 81 per cent of total cultivators are main workers, and census and NSSO estimates are close to each other. However, there

exists significant difference in the share of main agricultural labours in total agricultural labours between the two sources. In NSSO surveys only 6 per cent of total agricultural labours have subsidiary status, whereas in census marginal agricultural labours constitute 40 per cent share. It implies that up to 34 per cent of labours of census work only for less than 30 days in agriculture and they do not qualify to be counted as subsidiary agricultural labours in NSSO surveys. Further, the evidences indicate that outcome of this definitional difference is more striking for female workers. Thus, definitional difference in 'minor' time spent criteria is a source of gap in the estimate of agricultural labour between census and NSSO surveys. Nevertheless, contrary trends in estimates of agricultural labour are not explained by this.

TABLE 2. SHARE OF MAIN AGRICULTURAL WORKERS IN TOTAL AGRICULTURAL WORKERS

Sector	Gender	Census		NSSO		Ratio of NSSO over census	
		2001 (3)	2011 (4)	2004-05 (5)	2011-12 (6)	2001 (7)	2011 (8)
Ag. workers	Male	84	78	97	98	1.16	1.26
	Female	53	55	72	71	1.36	1.28
	Person	72	69	87	88	1.21	1.27
Cultivator	Male	92	88	97	98	1.06	1.11
	Female	61	64	73	71	1.21	1.11
	Person	81	81	88	90	1.08	1.11
Ag labour	Male	72	67	99	100	1.38	1.49
	Female	45	50	88	85	1.94	1.70
	Person	60	60	94	94	1.59	1.58
Others ag workers*	Male	85	81	93	94	1.10	1.17
	Female	60	56	41	41	0.68	0.74
	Person	74	71	59	66	0.80	0.93

\*Plantation crops (tea, coffee, coconut), livestock, fisheries and forestry.

Declining cultivators and increasing agricultural labours between the past two census years have been termed as rising casualisation of Indian agriculture (Gupta, 2016). Often it is attributed to the diminishing profitability of smallholders who are increasingly forced to sell their land and become agricultural labour. This distress-led argument of changing composition of agricultural workers based on census data is refuted if NSSO survey based declining trends in both cultivators and agricultural labours are believed to be correct. The trends based on NSSO surveys support the argument of development-led employment diversification wherein both cultivators and agricultural labours move out of agriculture.

#### *Long-Run Trends in Estimated Agricultural Workforce and Labour Use in Crop Cultivation*

Gender and occupation wise worker participation rates from the successive NSSO surveys were applied to census population to estimate the size of agricultural

workforce. Table 3 presents changes in the estimated agricultural workforce during 1993-94 to 2017-18. The sub-period 1993-94 to 2004-05 witnessed an increase in agricultural workforce (usual status) by 25 million at annual growth rate of about 1 per cent. The size of agricultural labour did not increase and incremental agricultural workforce during this period was only due to increase in the cultivators. The subsequent period till 2011-12 witnessed an unprecedented decline in the absolute number of agricultural workers by 37 million at annual growth rate of 2.09 per cent. The decline in agricultural workforce was due to withdrawal of both cultivators and labours, particularly female workers. The annual rate of withdrawal of female workers was more than 4 per cent in both cultivator and labour categories. As the period 2004-05 to 2011-12 was a period of high agricultural growth (Chand and Parappurathu, 2012), withdrawal of female workers is often characterised as an outcome of the improved economic conditions of farm households (Kannan and Raveendran, 2012). Most of these female workers did not join even non-farm sectors and confined themselves either in household activities or pursued education, resulting in the decline in labour force itself. Decline in male agricultural labours could be due to inter-sectoral movement of labours in anticipation of higher income as non-farm sectors in rural areas are up to five times more productive than casual activities at farm (Chand *et al.* 2017).

TABLE 3. CHANGES IN AGRICULTURAL WORKFORCE (USUAL STATUS) IN INDIA DURING 1993-94 TO 2017-18

Period (1)	Cultivators			Agricultural Labours			Agricultural Workers		
	Male (2)	Female (3)	Total (4)	Male (5)	Female (6)	Total (7)	Male (8)	Female (9)	Total (10)
Absolute numbers (million)									
1993-94	90	56	146	58	40	97	148	96	244
2004-05	101	72	172	57	40	96	157	112	269
2011-12	99	52	151	51	29	80	150	82	232
2017-18	109	39	148	33	21	54	142	60	202
Compound growth rate ( per cent)									
1994-2005	1.10	2.49	1.64	-0.17	0.00	-0.12	0.62	1.52	0.97
2005-2012	-0.29	-4.44	-1.88	-1.43	-4.38	-2.56	-0.68	-4.35	-2.09
2012-2018	1.75	-4.92	-0.38	-7.21	-5.02	-6.43	-0.90	-5.04	-2.29

Source: Authors' estimates based on NSSO estimates on activity-wise distribution of workers and census population.

During the recent period 2011-12 to 2017-18, withdrawal from agriculture accelerated and another 30 million agricultural workers left agriculture. The withdrawal from agriculture sector during the recent years was primarily led by agricultural labours, while the withdrawal by cultivators decelerated. The growth rate in the decline in the female agricultural workers accelerated to 5.04 per cent during recent period as compared to 4.35 per cent during previous period. Interestingly, male agricultural labours declined at historically highest rate of 7.21 per cent per annum during the latest period. Thus, successive NSSO surveys during the last 24 years have revealed consistent declining trend in agricultural labours in the country. On the other

hand, declining trend in cultivators is slowing down over time. In fact, the number of male cultivators has increased between 2011-12 and 2017-18. This could be either due to limited capacity of non-farm sectors to absorb the incoming workforce or effect of ongoing agricultural reforms raising their expectations about remunerative returns.

The gradual withdrawal of labourers from agricultural activities is also reflected from the declining labour use in crop cultivation in COC surveys (Table 4). Although the estimates of labour use from COC surveys are not directly comparable with NSSO estimates on the number of agricultural labours, trends in average labour use can be taken to externally validate trends in NSSO estimates. Similar to NSSO employment surveys, successive COC surveys have reported consistent decline in labour use in crop cultivation over time with significantly higher rate during the recent period 2011-12 to 2016-17. Further, reduction in labour use occurred for both male and female labours. The declining labour-intensity in crop cultivation is desirable if it is accompanied by a commensurate increase in farm mechanisation and farm operations are not affected. Such investigations are vital but outside the scope of the present study.

TABLE 4. CHANGES IN AVERAGE LABOUR USE AND COST OF CULTIVATION OF MAJOR CROPS DURING 1993-94 TO 2016-17

Year (1)	Average labour use (Hrs./ha)			Average real labour cost (Rs./ha) (5)	Average real labour wages (Rs./hr) (6)	Average real cost $A_1+FL$ (Rs./ha) (7)	Share of labour cost in cost $A_1+FL^*$ (8)
	Male (2)	Female (3)	Total (4)				
Absolute numbers							
1993-94	455	246	701	4367	6.2	10585	41.3
2004-05	419	223	642	4971	7.7	12938	38.4
2011-12	412	220	632	7205	11.4	15651	46.0
2016-17	366	189	555	7218	13.0	15705	46.0
Growth rate ( per cent)							
1994-2005	-0.89	-1.13	-0.97	1.30	2.10	2.03	-
2005-2012	-0.26	-0.15	-0.22	5.45	5.82	2.76	-
2012-2017	-2.34	-2.99	-2.56	0.04	2.67	0.07	-

\*At current prices.

#### *Effect of Withdrawal of Agricultural Labours on Farm Economy*

Presently, labour constitutes 46 per cent share in average cost of cultivation (Cost $A_1+FL$ ) of principal crops (Table 4). Due to a predominant factor of production, changes in labour supply have cost implications for the farmers. It is hypothesised that contraction in labour supply due to its withdrawal from agriculture pushes wages upwards which in turn leads to reduction in its use in farm operations. The cost implications of labour withdrawal largely depend on the relative changes in wages and labour use, and labour share in cost of cultivation.

A perusal of Table 4 reveals that average labour use in crop cultivation declined by 8 per cent between 1993-94 and 2004-05. But, despite reduction in labour use,

labour cost at real prices increased by 14 per cent on account of 33 per cent rise in real wages. Incremental labour cost contributed 26 per cent of the total increase in Cost  $A_1+FL$  during this period. Nevertheless, the share of labour in Cost  $A_1+FL$  reduced from 41.3 per cent in 1993-94 to 38.4 per cent in 2004-05 due to relatively higher increase in cost of other factors of production. The subsequent period till 2011-12 witnessed significant rise in real labour wages which resulted in 45 per cent increase in labour cost (despite decline in labour use). This inflated real cost  $A_1+FL$  by 82 per cent and the share of labour in cost increased to 46 per cent by the year 2011-12. Interestingly, decline in the labour use accelerated during the latest period 2011-12 to 2016-17 which negated the effect of rising wages on labour cost.

These evidences indicate that despite the reduction in labour use in crop cultivation, labour cost could not be saved during the past 24 years. This phenomenon is explained by the inelastic nature of demand of labour in crop cultivation. The estimated price elasticities of labour demand was negative and less than one in all the selected crops with the average value of -0.21 (Table 5). This implies that in the situation of wage rise, labour use in crop cultivation reduces less than proportionately resulting in rising labour cost. As the magnitude of reduction in labour use is insufficient to negate the wage-push cost inflation, it is necessary to promote farm mechanization and improve its economic access to farmers through institutional innovations (e.g. custom hiring centres). Srivastava *et al* (2017) have observed that present level of farm mechanisation is inadequate to offset the wage-push cost inflation in Indian agriculture.

TABLE 5. ESTIMATED ELASTICITIES OF LABOUR DEMAND IN SELECTED CROPS IN INDIA

Crop (1)	Price elasticity of labour demand (2)
Paddy	-0.20
Wheat	-0.27
Jowar	-0.25
Maize	-0.22
Arhar	-0.22
Gram	-0.16
Groundnut	-0.16
Rapeseed and Mustard	-0.23
Cotton	-0.20
Sugarcane	-0.20
Overall	-0.21

Source: Authors' estimation.

The estimated parameters of models have not been given due to paucity of space and can be obtained from the authors.

### *Effect of COVID-19 Pandemic Led Change in Labour Supply on Farm Economy*

After the first COVID-19 confirmed case reported on January 30, 2020 in Kerala, Indian government took proactive step and announced nationwide lockdown on March 24, 2020, for 21 days. Owing to the rising number of cases, lockdown was further extended till May 3, 2020. As period of lockdown coincided with *rabi* harvest

and *kharif* sowing seasons, agricultural activities (along with selected other essential services) were permitted with social distancing provisions. The labour-deficit state like Punjab, where farmers primarily depend on outside contractual labour for wheat harvesting and paddy transplanting, faced labour shortage to carry out these operations due to inter-state movement restrictions. The farm-level observations revealed that labour scarcity resulted in 24.4 and 46.6 per cent increase in wages for wheat harvesting and paddy transplanting in 2020 over previous year, respectively. The effect of such wage rise on cost was ascertained using estimated price elasticity of labour and share of these operations in cost  $A_1+FL$ .

A perusal of Table 6 reveals that due to the wage rise, estimated labour cost for harvesting of wheat and transplanting of paddy increased by 15.62 and 40.54 per cent, respectively in Punjab. Multiplication of change in labour cost with its share in Cost  $A_1+FL$  provides likely effect of COVID-19 led change in labour supply on cost of cultivation. The results show 1.1 per cent and 4.6 per cent change in Cost  $A_1+FL$  of wheat and paddy, respectively. In absolute terms, it is Rs. 287 per hectare for wheat and Rs. 1668 per hectare for paddy at 2016-17 prices.

TABLE 6. EFFECT OF COVID-19 ON FARM ECONOMY OF PUNJAB AND BIHAR

State (1)	Crop (2)	Price elasticity of labour demand (3)	Change in wages in 2020 (April-June) over 2019 (April- June) (per cent) (4)	Change in labour cost (per cent) (5)	Share of transplanting/ harvesting labour cost in cost $A_1+FL$ (per cent) (6)	Change in cost $A_1+FL$ due to change in wages (per cent) (7)
Punjab	Paddy	-0.13	46.6	40.54	11.4	4.6
	Wheat	-0.36	24.4	15.62	6.8	1.1
Bihar	Paddy	-0.18	Nil		13.9	-
	Wheat	-0.25	Nil		14.5	-

Source: Authors' estimation

In case of Bihar, it was expected that reverse migration would positively contribute to farm economy by pushing labour wages downwards due to increase in labour supply. However, farm-level observations revealed no change in labour wages as reverse migrating labour did not work at farm and preferred to work in public work programmes like Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS). Also, most of the labours started coming back to urban centres as soon as lockdown was relaxed (The Economic Times, 2020). Thus, disequilibrium in labour market created due to reverse migration did not show any effect on cost of cultivation in Bihar.

#### IV

#### CONCLUSIONS AND POLICY IMPLICATIONS

The evidences from census and NSSO surveys clearly point out rising trend in employment diversification from agriculture to non-farm sectors. NSSO surveys have reported relatively higher rate of decline in participation of agricultural workers as

compared to census. This is primarily accounted by wide variation and contrary trend in the estimates of agricultural labours from these data sources. The 2001-census estimates of agricultural labours were 20 per cent higher than 2004/05-NSSO estimates, and the gap further widened to 50 per cent by 2011-12. One of the sources of variation in the estimate of agricultural labour is “minor” time spent criterion used by these sources which excludes upto 34per cent of agricultural labours of census to be counted as subsidiary agricultural labours in NSSO surveys. Further, census provides evidences on rising casualisation of Indian agriculture wherein cultivators are turning to agricultural labours. On the other hand, NSSO surveys reveal consistent declining trend in both cultivators and agricultural labours. Such contrary trends in census and NSSO surveys create confusion while drawing policy implications. Census based evidences suggest distress-led transition of cultivators to agricultural labours, whereas NSSO surveys based evidences refute such trends and point out towards development-led employment diversification wherein both cultivators and agricultural labours move towards more productive non-farm sectors. The recent NSSO survey reveals deceleration in withdrawal of cultivators and acceleration in withdrawal of agricultural labours. Slow-down in withdrawal of cultivators could be due to the effect of ongoing agricultural reforms raising their expectations about remunerative returns from farming. This could also imply limited capacity of non-farm sectors to absorb the incoming workforce and necessitates strengthening of rural non-farm sectors so as to generate gainful employment opportunities. Successive cost of cultivation surveys also report a consistent decline in labour use in crop cultivation and therefore externally validate (though not directly comparable) the trends from NSSO surveys.

Withdrawal of agricultural labour affects farm economy either by creating physical scarcity of labour or through the rise in farm wages. Due to inelastic demand of labour, increase in wages could not bring proportionate decrease in labour use and resulted in increase in labour cost in crop cultivation. Thus, the extent of decline in labour use is found to be insufficient to negate the wage-push cost inflation. This warrants concerted efforts to accelerate pace of farm mechanisation and its economic access to farmers to partially substitute labour. Short-term disequilibrium in labour supply caused due to COVID-19 led lockdown increased cost  $A_1+FL$  by 1.1 per cent in wheat and 4.6 per cent in Paddy. However, farmers in Bihar did not witness any benefit on account of increased labour supply due to large scale reverse migration as labours preferred working in MGNREGS over farms.

#### NOTE

1) Cost  $A_1$  comprises of all paid out cost components such as value of hired human labour, hired bullock labour, maintenance and upkeep charges on owned bullock labour, upkeep charges of owned machines, hired machine charges, seed cost, pesticides cost, manure cost, fertiliser cost, canal irrigation charges, depreciation of implements and farm buildings, land revenue cess and other taxes, interest on working capital and miscellaneous expenses on other inputs. Imputed value of family labour (FL) was estimated by multiplying working hours of family labour with prevailing wage rate.

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