

Rising Farm Wages in India

The 'Pull' and 'Push' Factors

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April 2013

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List of Acronyms

AP	Andhra Pradesh
CACP	Commission for Agricultural Costs and Prices
CPI-AL	Consumer Price Index for Agricultural Labour
CSO	Central Statistics Office
EGS	Employment Guarantee Scheme
FY	Financial Year
GDP	Gross Domestic Product
GSDP	Gross State Domestic Product
Guj	Gujarat
Har	Haryana
HP	Himachal Pradesh
IAY	Indira Awaas Yojana
ILO	International Labour Organization
Kar	Karnataka
Maha	Maharashtra
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MoRD	Ministry of Rural Development
MP	Madhya Pradesh
MSP	Minimum Support Price
NSSO	National Sample Survey Office
OLS	Ordinary Least Squares
p.a.	Per Annum
Raj	Rajasthan
TN	Tamil Nadu
UP	Uttar Pradesh
WB	West Bengal
WR	Wage Rate



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Summary

During the Eleventh Five year Plan (2007-12), nominal farm wages in India increased by 17.5 per cent per annum (p.a), and real farm wages by 6.8 per cent p.a., registering the fastest growth since economic reforms began in 1991. Farming being labour intensive, this rapid increase in farm wages has raised cost of production of agri-commodities across the board. No wonder, farmers' organizations have been demanding higher and higher minimum support prices (MSPs) to cover increased costs of production. During CACP's regular interactions with farmers, often it is observed that farmers hold Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) scheme, started in 2006, responsible for this strong 'push' in farm wages and overall scarcity of farm labour. This scheme, they claim, is hitting them adversely as rising costs are not fully compensated by either MSPs or market prices.

But farm labour is generally at the bottom of economic pyramid. Rising farm wages should be good news for poverty watchers, as it must have led to faster reduction of poverty than in any other Plan since 1991. The Prime Minister did make a specific mention of this in his inaugural address to the 57th meeting of National Development Council on December 27, 2012.

These two, somewhat contrary feelings by the farming community and the policy makers, prompted us to look into what is happening to farm wages in India since 1990-91. The special focus is on what factors could be really influencing farm wages and what can be done to contain rising labour costs in agriculture with a view to moderate the 'cost push' factor in food prices.

For this, first a series of state level nominal farm wages is prepared for five farm operations: ploughing, sowing, transplanting, weeding, and harvesting, covering 16 major states that account for 93 percent of farm labour. This is then converted to real farm wages by using state-specific consumer price indices for agricultural labour (CPI-AL). The state level series so obtained are then aggregated by taking a weighted average, weights being the state level shares in farm labour, to form an all India picture of farm wages from 1990-91 to 2011-12.

It is interesting to note that the real farm wages increased by 3.7 percent p.a. during 1990s compared to only 2.1 percent p.a. during 2000s. So, if real wages had followed the same trend of 1990s in 2000s, the current level of real farm wages would have been higher than what it is today with MGNREGA. However, during the 2000s, there is a sort of v-shape behavior in real farm wages, declining by 1.8 percent p.a. during 2000-01 to 2006-07, and then rapidly rising by 6.8 percent p.a. during 2007-08 to 2011-12, and it is this later half that seems to be the result of MGNREGA 'push' as well as strong growth 'pull'.



Overall, to decipher the influence of plausible factors on farm wages over a two decade period, international experience in developing world does suggest that when economies grow fast, labour moves out from agriculture to non-agriculture sectors, particularly construction in urban areas. This often acts as a strong 'pull' factor raising farm wages for those who are left behind on the farms. Is this also the Indian experience? What we know is that the share of work force engaged in Indian agriculture declined from almost 65 percent in 1993-94 to only about 53 percent in 2009, and that of construction increased from 3.1 percent to 9.6 percent over the same period.

This paper captures the growth 'pull' factors through growth of overall GDP, or of construction-GDP or agri-GDP, while MGNREGA's 'push' factor is measured by the employment generated under the MGNREGA scheme. The econometric analysis is undertaken through a panel data set of 16 major states (by pooling) for the period 1990-91 through 2011-12. Analysis is also undertaken for each of these 16 states separately through time series analysis for different time periods.

The empirical results are interesting: that the growth 'pull' factors seem to have influenced more the rise in farm wages since 1990-91 than the 'push' factor of MGNREGA. At all India level, the results reveal that a 10 percent increase in lagged GSDP (overall), GSDP (agri) and GSDP (construction) leads to 2.4 percent, 2.1 percent and 2.8 percent increase in farm wage rates respectively. This indicates that the growth in construction sector GDP has somewhat stronger influence on farm wages than the growth of overall GDP or even agri-GDP. Impact of MGNREGA is also significant but is 4 to 6 times less effective than growth variables since 1990-91. Disaggregated analysis for each state shows that growth variables are highly significant in all the states while MGNREGA is significant in AP, Assam, MP, Punjab, Rajasthan, TN and West Bengal. But again, the relative impact is much less. Overall, the results suggest that the 'pull strategy' works better than the 'push strategy' to raise farm wages over longer term.

These results raise a pertinent policy issue: given fiscal constraints and high food inflation, if there was a trade-off between allocating resources for welfare schemes and increasing investments with a view to raise farm wages, could the money spent on MGNREGA (more than Rs 2 lakh crore) not be better used if it was for investment in say rural-urban construction, or for overall growth, or for agri-growth? These investments would have raised the growth rates in these sectors, and thereby 'pulled' the real farm wages through a natural process of development, whereby wages increase broadly in line with rising labour productivity.

But what is MGNREGA's nature? Is it an investment policy or a welfare scheme? Since the inception of MGNREGA in 2006, it is claimed that almost 51 per cent of its expenditure has been on works related to water conservation & irrigation and over 19 per cent on works related to rural connectivity. In its present form (as



revised in 2010), the Act allows works such as irrigation, horticulture, land development, on private land of small and marginal farmers which implies a coverage of 40 per cent of all cultivated area (80 per cent of all land holdings). But what has been the impact of these expenditures on say agri-growth is not very clear. There is hardly any nation-wide impact evaluation done by any third party credible institution. There are some micro level studies which paint a mixed picture about the assets created through this scheme, but also major leakages in some states so much so that even the Hon'ble Minister of Rural Development himself had to ask for a CAG probe into it.

Now that the scheme has been in operation for 7 years, is there a way to make it more productive and less dole oriented? One of the ways to do this could be that MGNREGA operations are dovetailed with agricultural operations, wherein say half of the current market wage rate is paid by the farmer and the other half by the Scheme. This would help agriculture labour to earn more than what MGNREGA offers, and also help the farmer save on labour costs, while simultaneously ensuring that the labor remains productive. Higher labour productivity, with contained labour costs for the farmer, will help moderate the 'cost push' factor in food inflation. So it can be a win-win situation, and can be coordinated through *panchayats*.

But as the relative prices of capital to labour start tilting towards labour, there would be increasing demand for farm mechanization. This would need facilitation through easy access to cheaper institutional credit for farm mechanization. In order to ensure that capital is used rationally on small farms, it would be advisable to free up the land lease market so that a market guided optimal holding size evolves, ensuring rational utilization of land, labour and capital.



Rising Farm Wages in India: The 'Pull' and 'Push' Factors

I. Backdrop

1. There has been a sharp escalation in the cost of production, especially labour costs, of most agricultural commodities in recent years. The issue of Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), which was initiated in 2006, pushing up the cost of agriculture is constantly debated amongst farmers, media dealing with agriculture and rural issues, and also various Ministries concerned¹. The argument forwarded is that MGNREGA has 'pushed' up the average wage of casual workers, distorted the rural labour markets by diverting them to non-farm rural jobs, thus creating an artificial labour shortage and raising the cost of production of agricultural commodities. This has, in turn, pushed agricultural prices up, contributing to high food inflation (Damodaran, 2012; Gulati and Saini, 2013).

2. But in a fast developing economy, there could also be the 'pull' factors exerting pressures on demand for rural labour, leading to increased migration from rural to urban areas, and thus pulling up farm wages. This is what normally has happened in most of the developing countries that have experienced fast growth. The Indian economy has grown at an average annual rate of 8 percent in recent years (during the Eleventh Plan from 2007-08 to 2011-12). The construction sector has also witnessed high growth at an average annual rate of 7.7 percent during the same period. The agricultural sector, itself, has registered a 3.6 percent annual growth in the Eleventh Plan against 2.4 percent in the Tenth Plan and 2.5 percent in the Ninth Plan. All this growth should have acted as a 'pull factor' to rising farm wages.

3. This interplay of 'push' and 'pull' factors needs to be further understood as landless labour often represents the poorest of the poor in rural areas and rising wages could be good news for him/her with a hope to getting out of poverty. This necessitates a deeper analysis of the issue of labour costs with a view to examine farm wages holistically, rather than just as an input in cost of production of agricultural commodities.

4. Accordingly, this paper examines the trends in farm wages over the last two decades at all India level as well as across major agri-states (section II); delineates the hypotheses of plausible factors that may be influencing farm wages (section III), and

¹ http://articles.economictimes.indiatimes.com/2013-02-14/news/37100327_1_rural-employment-agriculture-minister-farm-labour



then attempts to empirically test the relative impacts of the 'push' factor (MGNREGA) and the 'pull' factors (GDP variables) – both at State levels and all India level (section IV). Based on this empirical analysis, some policy suggestions are put forward in section V, with a view to ensure that farm labour gets its due while agriculture is also able to absorb the rising costs of labour by increasing productivity. Only then it can turn out to be a win-win situation for the country and its various stakeholders.

II. Trend in Farm Wages in India

5. A recent report released by International Labour Organization (ILO)², indicates that real wages in India declined in a majority of recent years, shrinking the purchasing power of wage earners. As per the Report, India's real wages fell 1 percent between 2008 and 2011, while labour productivity grew 7.6 percent in the same period. The trend, however, is surprising in the light of the country's rapid economic growth over the last decade. It also contrasts with the Employment–Unemployment Survey from the National Sample Survey Office (NSSO), conducted every five years along with the Consumer Expenditure Survey, in which salaried and casual workers report a 150 per cent increase in their earnings – much higher than the 52 per cent increase in the consumer price index – in the five years between 2004-05 and 2009-10. This makes one curious to know what is happening to farm wages when around half of the Indian work force is engaged in agriculture and also where much of the landless labour is working. There is no readily available estimate of an all India real farm wage. This paper makes an attempt to compile data from various sources to arrive at such an estimate and an analysis is done in terms of the behaviour of the wage rates over the period of last two decades- both at state and all-India levels.

6. Labour Bureau, Shimla compiles every month wage rates separately over various agricultural operations by states. The nominal farm wages are derived for each agricultural year, July to June, by averaging wages over five types of farm operations – ploughing, sowing, weeding, transplanting and harvesting – at the state level. Thus, state specific annualized/yearly wage rates are estimated over 12 months. Then, an all India estimate of the nominal farm wage is obtained by finding a weighted average of 16 major states³ which comprise 93 percent of the agri-labour force in the country. The weights used are the relative shares of each state in the total number of agricultural workers in the country. For this, state-wise data on

² Global Wages Report, 2012-13, ILO

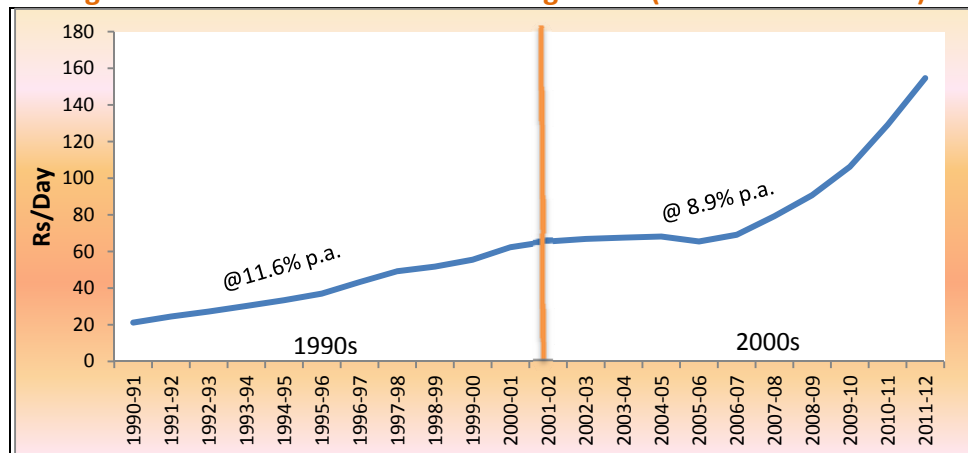
³ Include Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, H. P., Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal



agricultural workers⁴ is available from the population census. But these figures pertain to decadal census years 1990-91 and 2000-01. Therefore, 1990-91 census figures of agricultural workers in each state are used as weights to arrive at all-India wage rate over the sub-period of 1990-91 to 2000-01, and 2000-01 census figures, over the sub-period of 2000-01 to 2011-12.

7. The estimates, thus, generated give an insight into what has been happening to farm wages in India since 1990-91 (Figure 1). During the 1990s (1990-91 to 2000-01), the nominal farm wages grew at an average annual rate of 11.6 percent while during the 2000s (2001-02 to 2011-12), they grew at a lower rate of 8.9 percent per annum. Within the 2000s, however, nominal farm wages grew at only 1.8 percent per annum from 2001-02 to 2006-07 and at a high 17.5 percent per annum during 2007-08 to 2011-12.

Figure 1: All-India Nominal Farm Wage Rate (1990-91 to 2011-12)



Source: Computed based on data available from Labour Bureau, Shimla

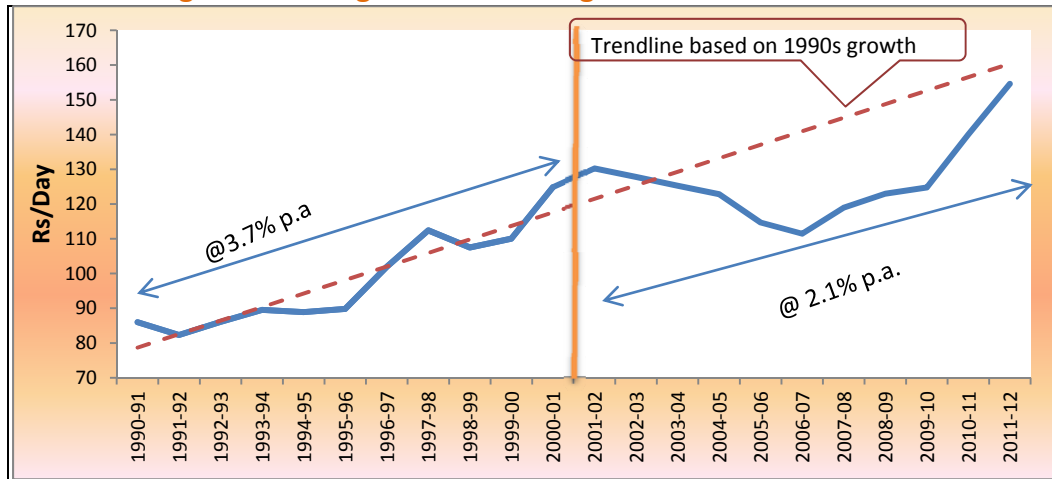
8. The real picture would be derived by analyzing what is happening to real farm wages. This real wage rate data (along with NSSO data on consumption) can be a useful tool to monitor the pace at which poverty could have declined in rural areas as rural poverty reduction and rise in agricultural wages are found to be closely correlated (Lanjou & Murgai, 2008). Thus, the annual state-wise nominal wages are first deflated with the state-specific consumer price index for agricultural labour (CPI-AL with base 1986-87) and then converted to a uniform base of 2011-12 prices. An all India estimate of the real farm wage is then obtained by finding a weighted average of the same 16 states with weights as the relative shares of each state in the total number of agricultural workers in the country.

⁴ Census figures give an estimate of farm workers i.e cultivators and agricultural workers separately in each state.



9. On analysis, an interesting trend emerges that real farm wages grew at an almost uniform rate during the 1990s, i.e., at an average annual rate of 3.7 percent. But during the 2000s they have followed a V-shaped pattern. Overall, during the 2000s (2001-02 to 2011-12), they grew at a lower rate of 2.1 percent per annum. More interestingly, within the 2000s, real wages, noticeably, fell by (-) 1.8 percent per annum from 2001-02 to 2006-07 and then grew at 6.8 percent per annum during 2007-08 to 2011-12⁵. Over the entire period 1990-91 to 2011-12, real farm wages have grown at an average annual rate of growth of 2.9 percent.

Figure 2: Average Real Farm Wage Rate at 2011-12 Prices



Source: Computed based on data available from Labour Bureau, Shimla

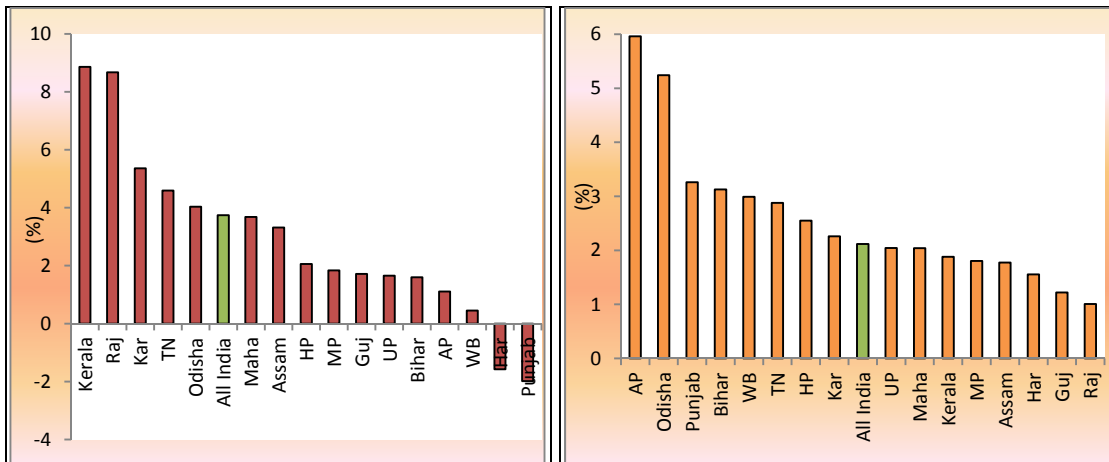
10. Thus, the all India trends in both nominal wages and real wages show that 1990s were better than the 2000s for agricultural labour. If the wages had followed the trend of the growth of 1990s, the real farm wage rate would have exceeded the current level in 2011-12 as is shown in figure 2. The period 2001-02 to 2006-07 was a difficult period for farm workers as farm wages actually declined during the period. Yet, it is somewhat queer to see that there was not much of a ‘noise’ from the farming community about rising farm wages in 1990s as is emanating today. Is it that there was no MGNREGA in 1990s for them to complain about and it was simply the invisible hand of market forces at work driving the farm wages? Or is it that farming was more remunerative in 1990s than in 2000s and it could easily absorb the rising real farm wages? Or any other factor at work? It would be worth pondering on some of these issues.

⁵ http://articles.economictimes.indiatimes.com/2012-10-04/news/34260152_1_agricultural-labour-wages-nso-data



11. In the meantime, it would be interesting to see what happened in different states with respect to real farm wages. There could be some surprises there too. The disaggregated data at the state level show that major states like Kerala, Rajasthan, Karnataka, Tamil Nadu, Maharashtra, Assam and Madhya Pradesh have observed a wage growth higher during the 1990s than the 2000s (Figure 3). Odisha is a state which has shown a high rate of growth of real farm wages in both the periods⁶. Two states viz., Gujarat and Haryana stand out with low growth of real farm wages throughout the entire period. It is puzzling as both states have shown high rates of overall growth, at least during the decade of 2000s and Gujarat has also registered the highest growth in agriculture (almost 10 percent per annum) during the decade of 2000s. So, seeing that its farm wages did not grow commensurately remains a mystery yet to be resolved.

Figure 3: State-wise Annual Average Growth of Real Farm Wage
1990s 2000s



Source: Computed based on data available from Labour Bureau, Shimla

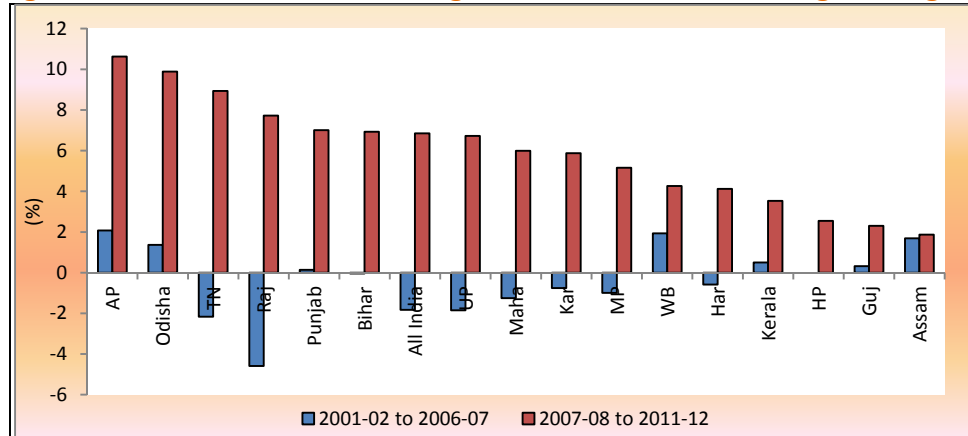
Note: The estimates are at 2011-12 prices

12. Within the 2000s, most of the states experienced negative growth of real farm wages during 2001-02 to 2006-07. But during 2007-08 to 2011-12, the growth of real farm wages accelerated with AP and Odisha registering around 10 percent growth in real farm wages, and Tamil Nadu and Rajasthan between 7 to 9 percent, over this period (Figure 4). Incidentally, it may be noted (as we will see in the following section) that these are also the states where MGNREGA has been very active and large number of man-days employment has been generated.

⁶ Incidentally, Odisha also registered the biggest drop in rural poverty amongst various states between 2004-05 and 2009-10.



Figure 4: State-wise Annual Average Growth of Real Farm Wage during 2000s



Source: Computed based on data available from Labour Bureau, Shimla
 Note: The estimates are at 2011-12 prices

III. Probable Factors Influencing Growth in Real Farm Wages

13. Thus, it is indisputable that there has been a perceptible rise in farm wages during the two decades. 1990s experienced a higher growth of real farm wages than the 2000s and the period 2001-02 to 2006-07 witnessed a negative growth. This raises the issue of what could be driving the trend in real farm wages. One hypothesis could be that it is the ‘pull’ of growth factors, say of overall GDP, or agri-GDP, or of construction sector that has helped pull the real farm wages. This is broadly in line with what has happened in several other developing economies (like China (Yusuf & Saich (2008)⁷, Thailand⁸ etc - in China about 150 million workers moved out of agriculture to build Shanghai and Beijing and other such cities). However, in the latter half of the 2000s, it could also be the ‘push’ factor of intervention of Government in rural labour market through MGNREGA since 2006, which has empowered the rural labour to negotiate higher wages for their farm work. The relative impact of each of these probable factors needs some further research which this paper tries to test through regression analysis in section IV.

III.1 Growth in GDP variables

Overall GDP

14. The growth rate of the Indian economy averaged 6.6 per cent (at 2011-12 prices) during the period 1990-91 to 2011-12 with 5.7 percent in the 1990s and 7.6 percent during the 2000s (Figure 5). During the first half of 2000s GDP grew at 7.3 percent per annum and accelerated to 7.9 percent in the latter half of the 2000s.

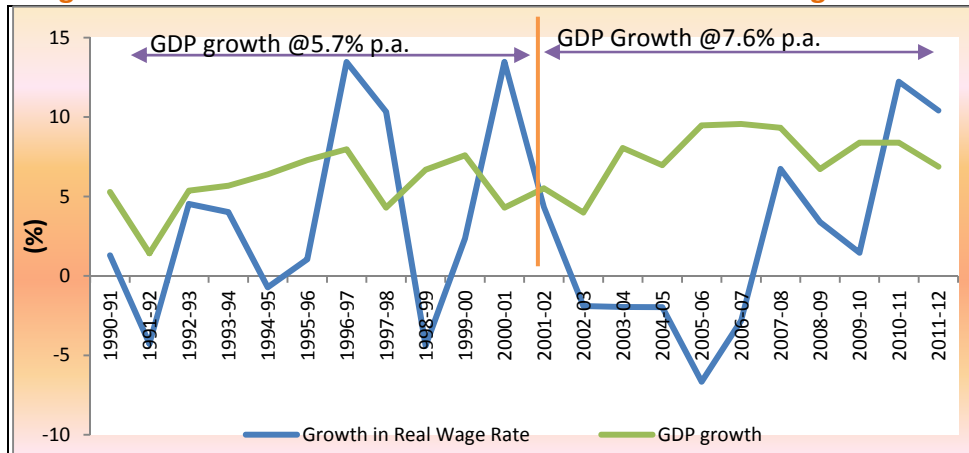
⁷ http://siteresources.worldbank.org/INTEAECOPRO/Resources/3087694-1206446474145/Chapter_3_China_Urbanizes.pdf

⁸ http://siteresources.worldbank.org/INTTHAILAND/Resources/333200-1089943634036/475256-1151398858396/LM_in_GMSs_Nov06.pdf



These rates of growth are unprecedented for the Indian economy and should have pulled up real incomes of the factor inputs.

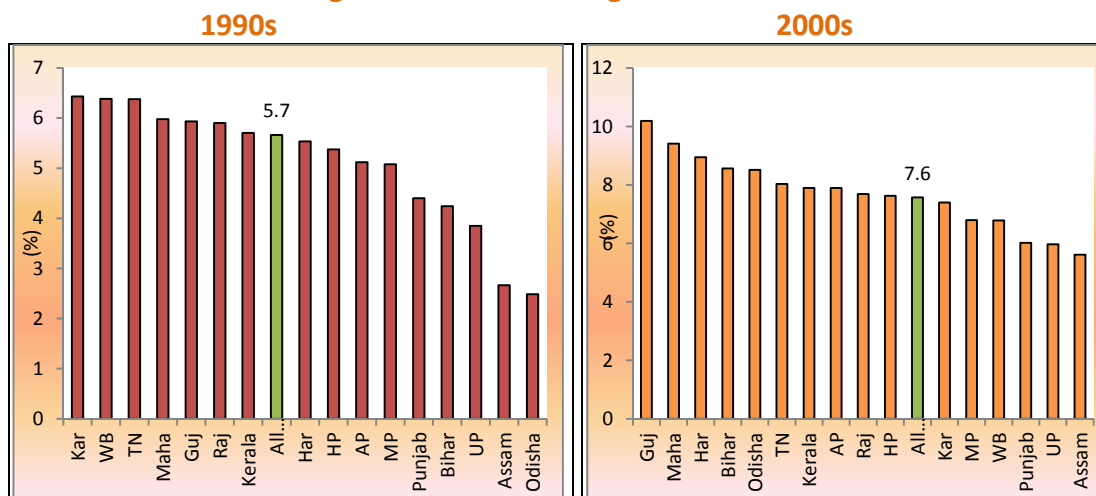
Figure 5: Relation between Growth Rates of Real Farm Wages & GDP



Source: Computed from figures available from CSO and Labour Bureau
 Note: The estimates are at 2011-12 prices

15. State wise GSDP growth figures show that states which showed high growth in real wages like TN, Kerala, Rajasthan, Maharashtra and Karnataka in the 1990s have also shown a high rate of growth in GSDP during the same period (Figure 6). AP, Bihar and Odisha have shown a higher growth in GSDP during the 2000s which is also reflected in their growth in real farm wages during the same period. However, it is interesting to note here again that Gujarat and Haryana which have grown at high rates during the entire period show low increase in wage rates.

Figure 6: Annual Average Growth of GSDP



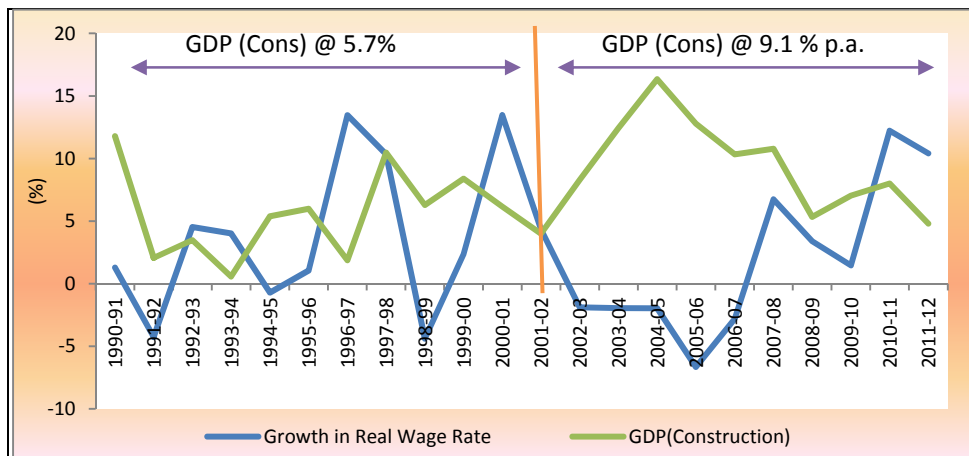
Source: Computed from figures available from CSO
 Note: The estimates are at 2011-12 prices



Growth in Construction Sector

16. Robust growth in the construction sector and the pull factor of prospects of higher wage at construction sites may have contributed significantly to the rise in farm wages. Of all the sectors and activities of the economy, growth in construction has been a major contributor to the overall growth in the economy. At all India level, average annual growth of GDP in construction (at 2011-12 prices) was 7.4 percent during the two decade period with 5.7 percent during the 1990s and 9.1 percent during the 2000s (Figure 7). Within the 2000s, GDP (Construction) grew at a high rate of 10.7 percent per annum in the first half which then slowed down marginally to 7.2 percent in the latter half. This contrasts with the negative growth in farm wages in the first half of 2000s and high growth in latter half of 2000s, and casts doubts whether this is the deciding factor in Indian case with respect to farm wages or is there a long lag between growth in construction sector and rise in farm wages? It needs to be tested econometrically.

Figure 7: Relation between Growth Rates of Real Farm Wages & GDP (Construction)



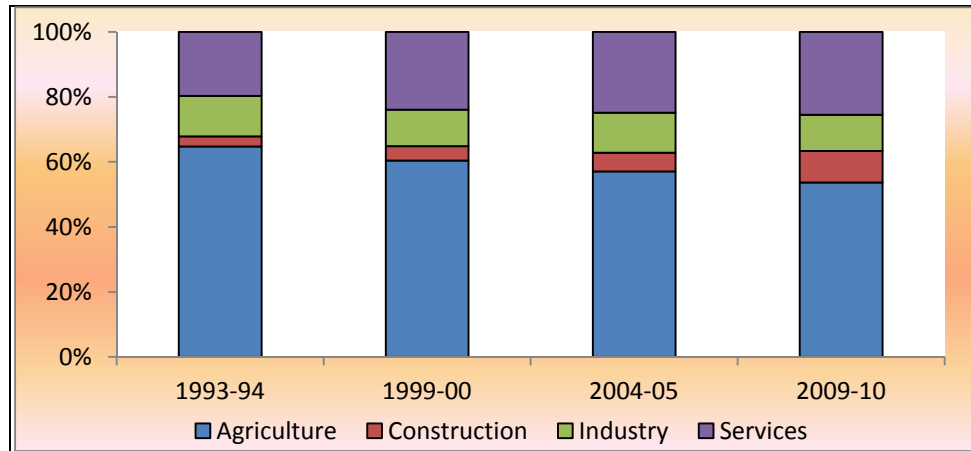
Source: Computed from figures available from CSO and Labour Bureau
 Note: The estimates are at 2011-12 prices

17. The employment in the construction sector has almost quadrupled from 1993-94 to 2009-10 (Figure 8). The share of agriculture in the total employment has fallen from 64.8 percent in 1993-94 to 53.2 percent in 2009-10. The corresponding figures for construction are 3.1 and 9.6 respectively. Also, according to 64th round of National Sample Survey (Migration in India), 2007-08, nearly 57 per cent of urban migrant households migrated from rural areas and mostly for employment related reasons. For rural males, around 20 percent were employed as casual labour after



migration. The migration rate for short-term migrant workers⁹ is estimated at 1.7 percent of the rural population and of all the rural male short-term migrant workers nearly 43 were engaged in construction. Thus, construction activity certainly competes for rural labour and would act as a pull on farm wages.

Figure 8: Employment across various sectors in India



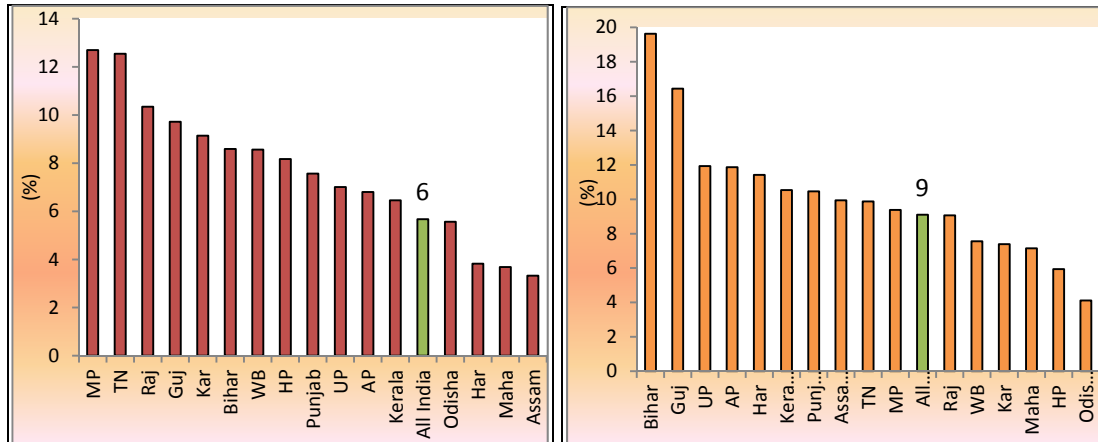
Source: NSSO Employment Surveys

18. State wise GSDP growth corroborate the relation between growth in GSDP (Construction) and growth in real farm wages especially for the states of TN, Kerala, Rajasthan and Karnataka in the 1990s (Figure 9). Bihar (@ 20 percent per annum) and AP have shown a higher growth in GSDP (Construction) during the 2000s which is also reflected in their growth in real farm wages during the same period. Interestingly, Odisha has the lowest rate of growth of construction sector in 2000s but has shown a high growth of farm wages. Again, Gujarat (during the entire period) and Haryana (in 2000s) have shown high rates of growth of construction activity but show low increase in real wage rates.

⁹ Short-term migrants have been defined as those who had stayed away from the village/town for a period of 1 month or more but less than 6 months during the last 365 days for employment or in search of employment.



Figure 9: State-wise Annual Average Growth of GDP (Construction) 1990s 2000s



Source: Computed from figures available from CSO
 Note: The estimates are at 2011-12 prices

Growth in Agri-GDP

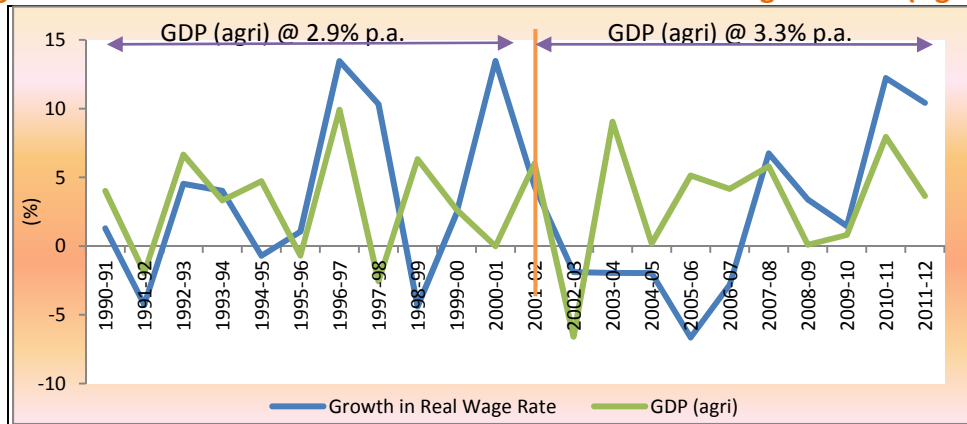
19. As farm wages are for workers employed in the agriculture sector, the main ‘pull’ factor could be growth in agricultural GDP itself. At all India level, average annual growth of GDP in agriculture (at 2011-12 prices) was 3.1 percent during the two decade period, with 2.9 percent during the 1990s and slightly higher at 3.3 percent during the 2000s (Figure 10). Within the 2000s, GDP (agri) grew at a rate of 3.0 percent per annum in the first half which then picked up to 3.7 percent in the latter half.

20. The period 1992-93 to 1996-97 (corresponding to the Eighth Plan) showed a rate of average annual growth of 4.8 percent per annum-highest plan growth experienced ever in India in agri-GDP. But this growth decelerated to almost half for the next ten years – 2.5 percent in the Ninth Plan (1997-98 to 2001-02) and 2.4 percent in Tenth Plan (2002-03 to 2006-07). The deceleration was seen across all crops and sectors and the magnitude of deceleration was significant enough to leave per capita output at lower levels than 1996-97 even in the year 2003-04 which was incidentally a year of excellent monsoon and record production (Himanshu, 2008). Incidentally this deceleration coincided with a downturn in world prices in the wake of East Asian Crisis in 1997, which touched a trough around 2001-02, followed by a slow recovery in global agri-prices from 2003 to 2005 (Gulati, 2011). This may have led to depressed farm incomes and thereby slow or even negative growth in real farm wages. In the face of declining farm incomes, there is generally a tendency to cut back on hired labour, which would imply a decline in demand for wage labour, which in turn can impact their wage rates adversely. Thus, deceleration in growth of



agriculture and declining profitability may be the reason for negative growth in real farm wages, particularly during 2001-02 to 2006-07.

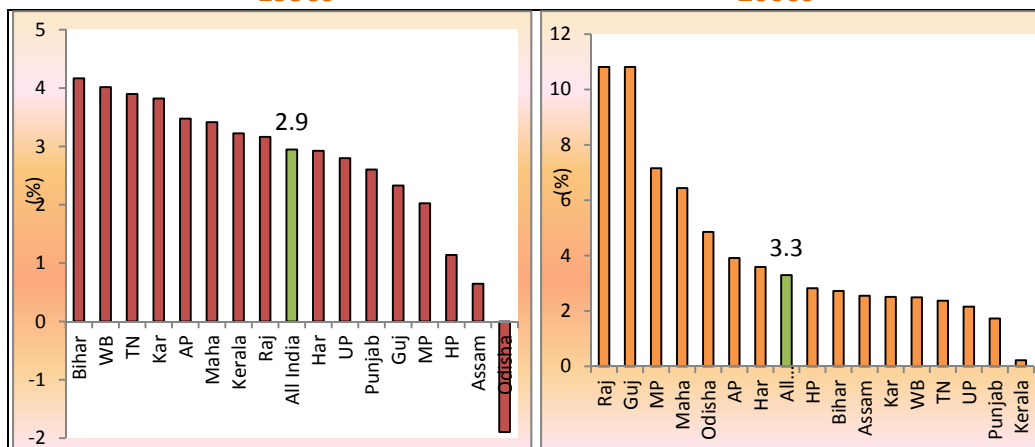
Figure 10: Relation between Growth Rates of Real Farm Wages & GDP (Agri)



Source: Computed from figures available from CSO and Labour Bureau
 Note: The estimates are at 2011-12 prices

21. State wise GSDP (agri) growth figures are higher for the states of TN, Kerala, Rajasthan and Karnataka in the 1990s which also have shown a high growth in real farm wages (Figure 11). Bihar showed highest growth in GDP (agri) during the 1990s but had a low rate of growth of farm wages. The highlight is Odisha which showed a negative growth in GSDP (agri) in the 1990s but increased its growth to 4.9 percent in the 2000s. Odisha is also one of the states with high growth of real farm wages. The puzzle of Gujarat for 2000 remains, which registered one of the highest growth in agri-GDP (more than 10 percent p.a) and yet its real farm wages grew at one of the slowest rates (less than 2 percent p.a) during the decade of 2000s.

Figure 11: State-wise Annual Average Growth of GSDP (Agri)
 1990s 2000s



Source: Computed from figures available from CSO
 Note: The estimates are at 2011-12 prices



III.2 MGNREGA

22. MGNREGA came into force on February 2, 2006 and was introduced in 200 of the most backward districts of the country and later extended to all rural districts of India from April 1, 2008 (GOI, 2013). It aims at enhancing livelihood security of households in rural areas of the country by providing at least one hundred days of guaranteed wage employment in a financial year to every household whose adult members volunteer to do unskilled manual work. Since its inception, MGNREGA has generated 1348 crore person days of employment and has involved an expenditure of around Rs 2 lakh crore (MoRD, 2013). At the national level, with the average nominal wage paid under the scheme increasing from Rs 65 in FY 2006-07 to Rs 115 in FY 2011-12, the bargaining power of agricultural labour has increased as even private sector wages have increased (MoRD, 2012). It has set a base price for labour in rural areas, improved the bargaining power of labourers and has led to a widespread increase in the cost of unskilled and temporary labour including agricultural labour.

23. Some recent research seems to support the idea of a rise in real casual labourer wages due to MGNREGA, with estimates ranging from 4% to 8% (Berg et al 2012, Azam 2012, Imbert and Papp 2012). NSSO data too indicate that the advent of MGNREGA has resulted in a significant structural break in rural wage increases. Between 1999 and 2005, pre-MGNREGA, nominal wages in the rural economy grew at an average annual rate of 2.7 per cent. Post-MGNREGA, average wage increases almost quadrupled to 9.7 per cent between 2006 and 2009¹⁰. There are, however, studies which argue that rise in casual wage rates cannot be wholly attributed to MGNREGA (Dutta et al, 2012). Mukherjee & Sinha (2011) have conceived a microeconomic model that establishes that the fact of a guarantee of employment at a given wage through the MGNREGA would introduce contestability in the rural labour market. In other words, in the presence of MGNREGA scheme the large land holders in rural areas may now need to raise wage of workers they hire in order to ensure the necessary supply of labour.

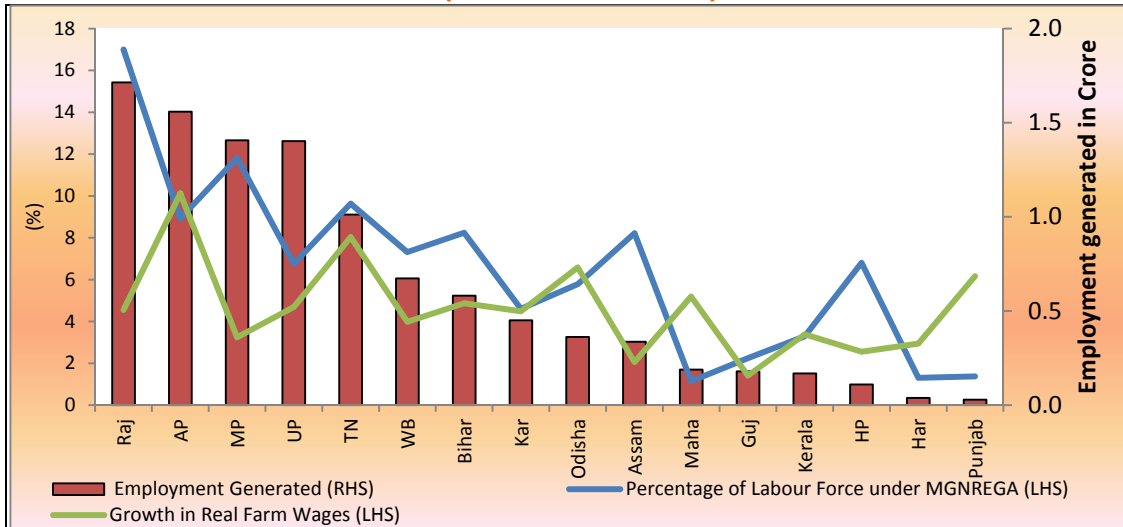
24. At all India level the magnitude of labour force covered under the MGNREGA has gone up from 6.2 per cent during 2007-08 to 9.8 per cent during 2009-10 and to 7.3 percent in 2011-12. For this, the number of people covered under MGNREGA is compiled from the data on person days available on the website of Ministry of Rural Development, based on the assumption of 100 man days being equivalent to employment of one labour. States, primarily AP, Rajasthan and TN, which have a

¹⁰ <http://indiaer.blogspot.in/2011/10/india-rural-wages-surge-to-support.html>



higher proportion of labour force engaged under MGNREGA have experienced a higher growth in real farm wages as is evident from Figure 12. These agriculturally prominent states, where the Scheme has contributed a lot in terms of its coverage, may be experiencing relatively higher pressure on both availability of farm labour and the level of farm wage.

Figure 12: MGNREGA & Growth in Real Farm Wages (2007-08 to 2011-12)



Source: Ministry of Rural Development (MoRD), Labour Bureau

Note: Estimates of rural labour force are derived for the years of 2007-08 and 2009-10 from 64th round of National Sample Survey, 2007-08 and 66th round of National Sample Survey, 2009

25. The wage rate under MGNREGA has been revised by the Central Government in most of the states and it goes way above Rs. 100 per day and ranges between Rs. 120 and Rs. 179 per day depending upon the states. Compared to the farm wage rate, the wage rate notified under MGNREGA was relatively higher in major states during 2007-08. The states where wage rate under MGNREGA was higher than that in farm sector were AP, Bihar, Haryana, MP, Karnataka and Punjab. However, a turn-about occurred during 2011-12 when the farm wage rate has gone up in almost all the states more than their respective levels of wages under MGNREGA (Figure 13). This phenomenon might provide a clue to how MGNREGA has impacted the wage rate in agriculture in revolutionizing expectation of increased wage guaranteed under MGNREGA, although the employment generated under MGNREGA hovers to less than 10 percent of total rural labour force in most of the years, and in majority of states.



Figure 13: MGNREGA Wage Rate and Farm Wages
2007-08 2011-12



Source: Ministry of Rural Development, Labour Bureau

26. Thus, there is evidence that MGNREGA has led to rise in the wages for unskilled labour but it is worth exploring what impact it has had on labour productivity. A basic economic principle is if a factor gets a return more than its productivity, the system is promoting inefficiency. Since the inception of MGNREGA, almost 51 per cent have been works related to water (water conservation, flood control, irrigation, drought proofing, renovation of traditional water bodies and micro-irrigation) and over 19 per cent works are related to rural connectivity. At such a scale, MGNREGA works has the potential to benefit rural communities by improving irrigation facilities, enhancing land productivity and connecting remote villages to input and output markets (MoRD, 2013). But there are only a few studies that have conducted rigorous scientific analysis on the actual productive performance of these assets. Further, the quality and durability of the assets vary vastly with district/region and cannot easily be generalized at the national level (MoRD, 2012).

27. In its present form (as revised in 2010), the Act allows works such as irrigation, horticulture, land development, on private land of small and marginal farmers¹¹ which implies a coverage of 40 per cent of all cultivated area (80 per cent of all land holdings). Since inception, 14 cent of the total works has been on lands of individual beneficiaries, a vast majority of which are small and marginal farmers. There are only a few studies that investigate the impact of these works on agriculture productivity

¹¹The Act allows works on private land belonging to the SCs and the STs or below poverty line families or to the beneficiaries of land reforms or to the beneficiaries under the Indira Awas Yojana (IAY) or that of the Small or Marginal Farmers as defined in the Agriculture Debt Waiver and Debt Relief Scheme, 2008, or to the beneficiaries under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006



and income of these farmers. Micro-level studies have shown a visible growth in agricultural production and productivity but more research is required to quantify the definite impact of MGNREGA on agricultural production and productivity at the macro-level (MoRD, 2012). Thus, an independent evaluation on the impact of the scheme on agriculture and the rural economy is required.

IV. Testing the hypothesis of ‘pull and push’: Model Specification & Results

28. In what has been reviewed and hypothesized above, it is evident that the overall growth including its sector specific growths in agriculture and construction, together with MGNREGA might have triggered growth in farm wage. In order to test the validity of this ‘pull and push’ hypothesis, log-linear panel regression for 16 major states has been attempted for the country as a whole by regressing nominal wage rate (WR) separately on various GDPs (construction, or agriculture or overall) with one year lag and employment generated under MGNREGA¹² in absolute numbers for the period of 1990-91 to 2011-12. At the state-level, similar regressions are run for the 16 states separately. For this, the number of people covered under MGNREGA is compiled from the data on person days available on the website of Ministry of Rural Development, based on the assumption of 100 man days being equivalent to employment of one labour. The beta values so derived from the model are then equivalent to the elasticity of dependent variable with respect to the independent variable.

29. The ordinary least squares (OLS) model specified is as follows:

$$\text{Log } Y_{ij} = \beta_0 + \beta_1 \text{ log } X_{ij-1} + \beta_2 \text{ log } L_{ij} + e_{ij}$$

Where Y_{ij} = nominal wage rate for i th state ($i=1,2,\dots,16$) and j th year ($j=1990-91$ to $2011-12$),

X_{ij-1} = nominal GDP in construction or agriculture or overall for i th state ($i=1,2,\dots,16$) and j th year ($j=1990-91$ to $2011-12$)

L_{ij} = employment generated under MGNREGA in absolute numbers for i th state and j th year ($j=1990-91$ to $2011-12$)

e_{ij} = error term distributed normally with mean 0 and variance 1.

30. For the panel data regression done on all 16 states combined for 1990-91 to 2011-12, it is found that a 10 percent increase in GDP (overall), agri-GDP and construction GDP, in three independent regression estimates, leads to 2.4 percent, 2.1 percent and 2.8 percent increase in farm wage rate respectively. Impact of

¹² Regressions were tried with using a dummy variable for MGNREGA also which yielded similar results for 16 states combined but at the state level, MGNREGA was found to be insignificant for almost all states. Also, pooled panel data regression was tried for the period 2006-07 to 2011-12 only, when MGNREGA was operational, but did not yield any significant or valid results.



MGNREGA is also significant with 10 percent increase in employment generated leading to around 0.3 – 0.5 percent increase in farm wages. The empirical results clearly show that the impact of growth variables on real farm wages is much greater than MGNREGA. Also, for all 16 states combined, growth in construction sector GDP has somewhat stronger influence on farm wages than the growth of overall GDP or even agri-GDP. This is corroborated by the experience of several other developing economies where construction sector pulls away farm labour (as was the case in China detailed in Yusuf and Saich (2008)). The empirical results are detailed in Table 1 below:

**Table 1: Summary Regression Results
(Panel Data for 16 States combined)**

Equations	
Log WR = 0.15 + 0.24 Log GSDP (t-1) + 0.04 MGNREGA (t) (7.41)	(6.93)
Log WR = 0.91 + 0.21 Log GSDP (Agri) (t-1) + 0.05 MGNREGA (t) (5.30)	(8.92)
Log WR = 0.31 + 0.28 Log GSDP (Construction) (t-1) + 0.03 MGNREGA (t) (9.25)	(4.34)

Note: WR: nominal Wage rate; GSDP (t-1): Lagged State GDP, GSDP (agri) (t-1): Lagged State GDP (agri); GSDP (construction) (t-1): Lagged State GDP (construction)
The t-values, used for analyzing the variables’ explanatory relevance in the model, for the independent variables are given below each equation in parenthesis and are significant at 95% level of confidence. The R² estimates are not reported as they are usually insignificant in a panel data regression.

31. Regressions were attempted for individual states also and have been classified as per the results in Table 2. Growth variables (GDP (overall) or GDP(agri) or GDP(const)) are highly significant in all the states. GSDP (agri) emerges as a significant factor in almost all the states. GSDP (construction) is a significant factor in 9 out of the 16 states. MGNREGA emerges as significant in AP, Assam, MP, Punjab, Rajasthan, TN and West Bengal but its impact is much less than the growth variables. It may be noted here that most of these states have a high generation of employment under MGNREGA (Figure 12). This implies that the states where MGNREGA has bigger impact are the ones where man days from MGNREGA have been the most. The detailed results may be seen in Annexure I.



Table 2: State-wise Impact of GDP Variables and MGNREGA

Variables	GSDP (t-1)	GSDP (agri) (t-1)	GSDP (Construction (t-1)
Significant MGNREGA	AP, MP, Rajasthan, WB	AP, Assam, Punjab, Rajasthan, WB	Haryana, Rajasthan, TN
Insignificant MGNREGA	Assam, Gujarat, Haryana, Punjab, TN, UP	Bihar, Gujarat, Haryana, HP, Karnataka, Maharashtra, MP, Odisha, UP	AP, Assam, Bihar, Gujarat, Kerala, Punjab, WB

Note: Detailed State-wise results may be seen in Annexure I

V. Policy Implications – The Way Forward

32. The analysis of real farm wages over a twenty year period, interestingly, reveals that the growth rate of real farm wages was higher in the 1990s than the 2000s. If the real farm wages would have continued to grow at the trend rate of the 1990s, the current level in 2011-12 would have been higher than what it actually is. And there was no MGNREGA during 1990s. The period 2001-02 to 2006-07, however, witnessed a negative growth in wages which seems to be coming primarily from deceleration in agri-growth. After 2006-07, agri-growth has also picked up providing a ‘pull’ to farm wages and the push factor of MGNREGA has also lifted the real farm wages. The two together may have ‘pulled and pushed’ the real wages to 6.8 percent per annum during this period, which is unprecedented in the last two decades, and presumably even before that.

33. Empirical analysis shows that both ‘push’ and ‘pull’ factors have played a significant role in rising real farm wages. But the impact of growth variables (GDP (overall) or GDP (agri) or GDP(construction)) is almost 4-6 times higher than the MGNREGA impact. State-wise results also show that growth variables are highly significant in all the states. MGNREGA emerges as significant in AP, Assam, MP, Punjab, Rajasthan, TN and West Bengal but its impact is much less than the growth variables. These are also mostly the states where man days from MGNREGA have been the most. State-specific analysis of regression results testifies to the fact that it is the growth dynamics that has stimulated wage growth in agriculture in rural India. The results point to the fact that the ‘pull strategy’ is more desirable than the ‘push strategy’, meaning growth oriented investments are likely to be a better bet for raising rural wages and lowering poverty than the welfare oriented MGNREGA schemes.



34. These empirical results raise a pertinent policy issue: could the money spent on MGNREGA (around Rs 2 lakh crore) be better used if it was for investment in agriculture/rural-urban construction? This would have certainly helped these sectors to grow even faster, providing a strong 'pull factor' to raise farm wages in line with rising productivity in those sectors, making the whole process much more economically efficient and sustainable. Further research is needed to work out the marginal returns on investing in agriculture and/or construction activity (say infrastructure) vis-à-vis spending on MGNREGA where benefits are not directly quantified from the various assets being created. Given fiscal constraints (high fiscal deficit) and high food inflation, there is always a trade-off between allocating resources for welfare schemes and increasing investments. Research shows that the marginal returns in terms of poverty alleviation or accelerating agricultural growth are much lower from subsidies than from investments in rural roads or agri-R&D or irrigation (Fan, Gulati and Thorat 2007). Even if it is appreciated that MGNREGA creates durable assets, their productive performance and the cost involved are important considerations. There have been reports of gross irregularities in the implementation of the Scheme with the current Hon'ble Minister of Rural Development himself asking for a CAG probe^{13,14} and the former Minister of Rural Development also alleging lack of effective monitoring¹⁵. This has serious implications on the overall investment/resource allocation strategy.

Towards Fusion between MGNREGA and Farm Operations

35. The key question is: if MGNREGA raises farm wages without commensurate increases in labour productivity, it will make agriculture costly and uncompetitive, and will lead to cost push food inflation. This in turn will necessitate more dearness allowances to organized sector and exposing the informal sector to higher doses of food inflation. Will that work for long? The best way to fully overcome this difficulty is to think of a fusion between MGNREGA Scheme and agriculture operations with a view to raise agricultural productivity and overall growth. The current provisions of the scheme indicate that MGNREGA labour can be employed on private farms of SC/ST and small and marginal farmers and the list of permissible works under MGNREGA has been expanded with a focus to strengthen the synergy between MGNREGA and rural livelihoods, particularly agriculture, and create durable quality

¹³<http://post.jagran.com/jairam-ramesh-seeks-cbi-probe-into-mgnrega-irregularities-in-up-1354682392>

¹⁴http://articles.timesofindia.indiatimes.com/2012-08-20/india/33287155_1_flagship-rural-employment-programme-jairam-ramesh-nrega

¹⁵ 'NREGA is now a child without a guardian-interview with Dr. Raghuvansh Prasad Singh' published in Bureaucracy Today, April 2013



assets. So far it seems this clause has not been used much by the states and largely community works have been undertaken with welfare objectives in mind.

36. The modus operandi for the proposed fusion can be such that farmers register their demand with the Panchayats for MGNREGA labour to be used for their specific agri-operations. The MGNREGA in-charge can then have groups of labour that specialize in those types of agri-operations and move from one farm to another. These workers can be given wage rates from MGNREGA scheme as well as a part can be topped up by the farmers -in 75: 25 or 60:40 or 50:50 ratio. This way, the MGNREGA worker will get a higher wage rate than generally what is being paid to him under the scheme. The farmer will gain because he will have to pay only the additional top up (say 25 to 50%). This way, the labour would make more money than he/she is making today under MGNREGA, but will presumably have to work also more intensively on the farms. The farmer will not suffer from increased wages, and thus the cost of production of crops may not increase that much on account of labour costs, keeping food prices increases to moderate levels. This, therefore, can be a win-win situation for MGNREGA work force as well as agriculture operations. This way the nation will gain as the labour cost in agriculture can be contained and the demand pressure on raising minimum support price (MSP) for agriculture crops can also be kept within limits. If the country fails to innovate and create synergy between MGNREGA and farm operations, ceteris paribus, Indian agriculture is likely to become high cost, hitting the poor more adversely and will also not be globally competitive.

37. It is worth noting here that in case of Employment Guarantee Scheme (EGS) in Maharashtra, which was a role model for the expansion of MGNREGA schemes, employment was offered only during lean periods and not in sowing or harvesting seasons. Also, it was kept in mind that EGS wages should be always somewhat lower than the market wage rates in the state. These two conditions generally implied that EGS did not interfere with agriculture. It acted more as a supplementary job scheme to augment incomes of farm labour, whenever agriculture operations did not demand labour. But the current MGNREGA seems to be violating both these norms. The employment under this scheme often competes with agri-operations and thus makes agriculture difficult to deliver as a cost effective and remunerative occupation. This makes the matters worse, when the MGNREGA wages are higher than market farm wages. Both these anomalies need to be ironed out if this scheme has to succeed without converting agriculture into a high cost venture.



38. Other things remaining equal, the relative prices of capital to labour will certainly start tilting towards labour, leading to increasing mechanization of farms. This may require some capital subsidies to start with, but should eventually help in raising labour productivity in agriculture. And this could be a catalyst in alleviating poverty even faster. In order to ensure that this farm mechanization takes place in an economically efficient manner, it is important to free up the land lease market so that a market guided optimal holding size evolves, ensuring rational utilization of land, labour and capital. Further, to absorb rising labour costs, some upward adjustment may be needed in MSPs of more labour intensive crops like paddy, jute, etc. so that farmers' incentives and incomes don't suffer.



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State-wise Regression Results for 1990-91 to 2011-12

Variables	AP	Assam	Bihar*	Guj#	Har	HP	Kar	Kerala#	MP*	Maha	Odisha*	Punjab	Raj	TN*	UP	WB
Constant	-7.87	-5.88	-10.64	-0.57	-4.98	-5.39	-10.81		-6.30	-9.98	-7.63	-4.68	-13.91		-8.71	-3.81
AGDP(t-1)	0.78	0.72	1.00	0.32	0.66	0.79	1.00		0.69	0.85	0.82	0.62	0.21		0.82	0.52
t-value	S(5%)	S(5%)	S(5%)	S(5%)	S(5%)	S(5%)	S(5%)		S(5%)	S(5%)	S(5%)	S(5%)	S(5%)		S(5%)	S(5%)
MGNREGA(A,t)	0.01	0.01	0.00	0.00	0.01	0.00	0.01		0.00	0.01	0.00	0.01	0.05		0	0.01
t-value	S(10%)	S(10%)	NS(10%)	NS(10%)	NS(10%)	NS(10%)	NS(10%)		NS(10%)	NS(10%)	NS(10%)	S(10%)	S(10%)		NS(10%)	S(5%)
Adjusted R ²	0.97	0.97	0.87	0.91	0.97	1.00	0.93		0.85	0.94	0.89	0.95	0.94		0.99	0.97
Constant	-3.45	-2.43	-1.23	0.90	1.25			1.40				-1.37	-4.31	-1.46		-1.71
CGDP(t-1)	0.54	0.96	0.40	0.23	0.25			0.28				0.45	0.28	0.42		0.42
t-value	S(5%)	S(5%)	S(5%)	S(5%)	S(5%)			S(5%)				S(5%)	S(5%)	S(5%)		S(5%)
MGNREGA(A,t)	0	0	0.00	0.00	0.02			0.00				0	0.03	0.00		0
t-value	NS(10%)	NS(10%)	NS(10%)	NS(10%)	S(10%)			NS(10%)				NS(10%)	S(10%)	S(10%)		NS(10%)
Adjusted R ²	0.97	0.96	0.72	0.92	0.86			0.52				0.91	0.91	0.82		0.9
Constant	-5.85	-4.67		-1.97	-2.12				-5.89			-3.13	-10.1	-4.67	-6.98	-3.06
GSDP(t-1)	0.59	0.58		0.37	0.42				0.61			0.48	0.24	0.55	0.66	0.43
t-value	S(5%)	S(5%)		S(5%)	S(5%)				S(5%)			S(5%)	S(5%)	S(5%)	S(5%)	S(5%)
MGNREGA(A,t)	0.01	0		0.00	0.01				0.00			0.01	0.04	0.00	0	0.01
t-value	S(5%)	NS(10%)		NS(10%)	NS(10%)				S(5%)			NS(10%)	S(5%)	NS(10%)	NS(10%)	S(10%)
Adjusted R ²	0.96	0.97		0.94	0.92				0.95			0.93	0.96	0.86	0.97	0.95

*For the period 1995-96 to 2011-12

#For the period 2000-01 to 2011-12