

AGRICULTURAL GROWTH AND STAGNATION IN BIHAR: HISTORY AND PROSPECTS

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ABSTRACT

The state of Bihar in India draws academic attention mostly for its backwardness. Given that there is very poor industrial base in the state, the majority of its inhabitants still are dependent of agricultural activities for their livelihood. In the near foreseeable future, in absence of any significant change in its economic structure, the growth dynamics of agricultural sector will keep influencing the overall growth of the state. Given this importance, the present paper attempts to understand the nature and character of agricultural growth in the state in the last six decades. This is done to identify some crucial patterns that may guide any possible intervention to ameliorate the agrarian stagnation. Change in cropping pattern, expanding reliable irrigation, and focus on rice yields appear to be holding key to future progress.

Keywords: Agricultural Growth, Yield Increase, Irrigation, Cropping Pattern.

Located in the one of the most fertile geographical belt of the country, the state of Bihar should have ideally become one of the grain bowls of the country. Unfortunately, it has acquired an image of a destitute state, sending lakhs of its poor inhabitants, mostly rural, outside the state looking for sources of survival. The recent images of “migrant workers” walking down the highways to go back to their respective homes may have evoked sympathy and outrage regarding handling of the pandemic situation arising out of Covid virus spread, but it generally did not evoke an equally strong condemnation regarding a long history of neglect and apathy that has been part of their existence in their home states. Bihar being one of such states,

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also requires a close examination of how has it been doing when it comes to livelihood of the millions inhabiting its villages. The present paper is motivated by this urgent need to shift focus towards the “center of underdevelopment”, Bihar remains the poorest of all states in India in terms of per capita income.²

Bihar is the least urbanised state of India as only 11.3 per cent of its total population resides in the urban areas according to the last Census. An overwhelming majority of the rural households are engaged in agricultural activities for their livelihood. The extreme poverty of Bihari populace and the state's underdevelopment therefore, has to be located primarily in its agricultural sector. This is not to say that there is no need for structural transformation of the state, but it is proposed that in absence of that transformation, the center of backwardness has to be located in its agrarian sector. It is with this perspective that the present work orients itself towards examining the nature and extent of agricultural growth or stagnation in the state since 1960s.

The first section of the paper will try to identify the most important contributor of growth in Bihar agriculture by looking at area, production and yield statistics. Once that is done, the second section will look into a more disaggregated picture to identify a temporal pattern of growth as well as to identify the crops that may have contributed the most towards growth. This reflects a highly uneven growth character, even when the growth is modest by all standards. Finally, by analysing these trends, overall nature and character of agricultural growth will be ascertained. Through this the future prospects and a policy direction may also be spelt out.

IDENTIFYING SOURCES OF AGRICULTURAL GROWTH

The present study will attempt to decipher the broad trends in agricultural output growth in Bihar starting from sixties. The next task is to decompose the total agricultural production in its three component parts – area expansion, yield increase and changes in cropping pattern. A further decomposition is suggested (Narain 1977)

² *Bihar Economic Survey 2019*. Department of Finance, Government of Bihar.

to identify the contribution of locational shifts³ (though it has been accepted that its significance has reduced in the later part of sixties for the Indian agriculture). This will help in identifying particular pattern of growth and then making comparisons across periods. The following discussion will present a brief summary of empirical findings in this regard.

It is needless to restate that the scope of production growth through area expansion had already been exhausted during the colonial period itself. The figures for net sown area testify for the same. Though increase in cropping intensity, and consequently in total cropped area (gross sown area) is usually seen as a possible source of expansion of area under different crops. Interestingly, the data for Bihar shown a stubborn inertia in this regard. As can be seen from Table 1, the cropping intensity has remained in its 130 to 135 range before 1980 and marginally increasing to hover between 135 and 139 during 1980s. It falls back to its pre 1980s range during 1990s, recovering to the 1980s level during the first decade of this century. Between 1960 and 2010, it remains trapped below 138. It appears that it is breaking the ceiling of 140 only during the second decade of this century consistently.⁴ It would be interesting to explore the factors behind this turnaround. Irrigation expansion should be the first potential facilitator in this regard.

Table 1: Net sown area, Total cropped area and Cropping intensity in Bihar

Year	Net area sown (Thousand Hectares)	Total cropped Area (Thousand Hectares)	Area cropped more than once (Thousand Hectares)	Cropping intensity
1960-61	8032.1	11106.8	3074.7	138.28
1970-71	8454.4	11026.1	2571.7	130.42

³ This is to refer to shifting cultivation of a particular crop from a region with low land productivity to a region having high land productivity.

⁴ This decade seems to be a potential turning point if this increase in cropping intensity is seen together with many other positive changes observed. Some of them are discussed below.

1980-81	8314.5	11148.1	2833.6	134.08
1990-91	7702.5	10483.9	2781.4	136.11
2000-01	5663	7992	2330	141.13
2010-11	5258.7	7194	1935.3	136.80
2017-18	5241.97	7525.18	2283.21	143.56

Source: Directorate of Economics and Statistics, Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture, Government of India.

If we look at the area under different crops during this period it suggests an almost stagnant pattern. The diversification that is usually associated with agrarian progress does not seem to be affecting Bihar agriculture. Not only it remains exhaustively centered around food grain production, it lost some of its diversity that has existed during the decade of 1960s. The food grain production did contain a significant area that was devoted to production of pulses. There is a precipitate decline in this area and food grain production grew more cereal centric. The share of pulses became one third of its initial value. The loss was largely a result of expansion of area under cereals.

Table 2: Share of different crops in total cropping area

Area under different crops as a percentage of total cropped area						
Year	Rice	Wheat	Maize	Cereals	Pulses	Food grains
1962-63	46.90	6.46	7.54	68.61	20.55	89.16
1970-71	47.84	11.93	8.99	74.94	14.92	89.86
1980-81	49.79	15.74	7.92	77.66	12.27	89.93
1990-91	51.42	18.74	6.34	78.71	11.21	89.93
2000-01	45.75	25.87	7.76	80.08	8.97	89.06
2010-11	39.37	29.24	8.97	78.17	8.51	86.68
2015-16	42.69	27.87	9.31	80.20	6.58	86.77
2017-18	43.98	27.92	9.00	81.20	6.77	87.97

Note: Figures for the years 2017-18 for rice, wheat and maize are taken from Department of Agriculture, Govt. of Bihar. Rest are as mentioned in the source below.

Source: Directorate of Economics and Statistics, Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture, Government of India.

The broad pattern of crop cultivation is therefore, remarkably stable. Area under other crops, other than food grains, as a result remain broadly unchanged. Though this may hide some minor changes in cropping pattern. As it is seen, area under wheat has increased significantly over time, largely at the cost of pulses. But the increase in the share of rice and wheat together also suggest that within the cereals, there is some loss suffered by other coarse cereals- their cultivation has gone down from already what was a very small share. Paddy – wheat cycle has effectively dominating the cultivation cycle.

Recently there are some signs of change in the cropping pattern, appearing insignificant right now, but containing a potential to transform the nature of cropping pattern. Table 3 shows that in the last two and half decades, the share of fruits and vegetables has increased by about 4 percentage points, though not in a linear fashion. But this increase has tapered out and the share is stable after the year 2003-04. Sugarcane, whose cultivation area has not changed in the last five decades since 1960, suddenly more than doubled its share in the year 2010-11 and afterwards maintaining this level. Perhaps, this is in response to a new initiative of the state government to re-start some of the sugar mills closed for a long time. It is however, important to note that both these crops are highly irrigation intensive and their potential growth or stagnation remains dependent on expansion in reliable irrigation. Interestingly, area under maize cultivation has also shown a reversal of trend in the recent times.

Thus the land use and cropping pattern suggests a few things. One, like many other states, there is no scope for increasing the net sown area. In fact, the proportion of net sown area in the total geographical area of the state shows that it is already higher than the national average. In all likelihood it may fall further. It has already declined considerably in two phases – the first time it is witnessed is during 1980s and then again in the beginning of this century. Given the pressure of growing urbanisation and of a growing real estate market, the competing usage may easily push cultivation area down.⁵

⁵ As mentioned above, presently Bihar is one of the least urbanized states in India. But it cannot be expected to remain in the same situation any further. Consequently, there is going to be loss of cultivable land to growing urbanization.

Second, the total cropped area, in absence of any change in cropping intensity, has also reflected the same tendency as shown by net sown area. In tune with the latter, showing the same time pattern, it has also gone down significantly. Given these two observations, it is clear that overall agricultural growth in Bihar, which has been very modest at best, has been marked by an absence of increase in area - neither has it seen any increase in net sown area, nor in gross cropped area.

Third, the broad cropping pattern exhibits a certain conservatism. Share of area under different crops reflects a stagnant pattern at best. Not only it remains food grain centric, within that it is overwhelmingly cereal dominated. There is even a loss of diversity within the cereal category, coarse cereals losing ground over time. Over the decades, Bihar agriculture has acquired a more pronounced “monoculture” character dominated by paddy – wheat cycle. Therefore any analysis of agricultural growth has to take into account the fact that it is overwhelmingly influenced by performance of these two crops, even when paddy has lost some ground to wheat.⁶

Therefore, it leaves us to believe that most of the increase has come from yield improvements, though considerable variation is found across crops. It is clear that food grain production has registered a decline in area during the entire period despite retaining its share. Wheat, however, has expanded substantially in terms of area during the period, with the late 1960s and 1970s witnessing the maximum increase. It exhibits an almost stagnant area in the last two decades. Among the cash crops, it was essentially fruits and vegetables which increased their share in total area. Recently, area under sugarcane cultivation has also increased substantially.

⁶ This loss appears to be in the area under paddy of *garma* variety which is also closely related with declining public irrigation cover. However, there may be other factors at work. One possible factor could be late sowing and harvesting of paddy during kharif season, delaying the next rabi crop, and consequently, leaving insufficient time for this variety of rice before the start of the next cropping season.

UNEVENNESS OF GROWTH PERFORMANCE

Increase in yield remains the most important contributor to overall growth. In fact the negative growth of area in many cases was more than offset by a significant increase in yield levels. Crop wise performance in this regard, however, is varied with some crops registering huge increment in yield levels. It is noted that the overall increase in the value of production may also be due to the increased production of high value crops to an extent possible under the evolutionary pattern of crop mix in Bihar agriculture, which so far has allowed only a small change. Once again this is a combined effect of area expansion of these crops as well as increase in yield levels. A disaggregated picture is therefore, required to bring to the fore the relative contribution of each of these effects.

Identifying periods of growth spurts or stagnation

The discussion on agricultural growth in India remains heavily influenced by the experience of the Green Revolution. The same is the case with Bihar's agrarian studies. The fact that the Green Revolution came to the state, even in its limited sense, only in the 1980s, that it has become a fashion to compare the performance of the decade of eighties with the preceding decades. The apparent validation of the popular perception of a successful technological experiment seems to be also the case in Bihar. In the first three decades starting from 1960s, the value of total agricultural production has grown at an average rate of 2.3 percent per annum - the 1980s registering the highest rate of 3.03 percent and the decade of seventies witnessing the worst performance, with value of output growing merely at an average rate of 0.3 percent (Table 4). Among the major crop groups, food grains including cereals and pulses correspond to this pattern, pulses witnessing a positive rate of growth during 1980s. In the case of cash crops their most impressive increase has been registered during the sixties, with oilseeds being an exception growing at a rapid rate during the nineties.

Table 4: Average annual growth rates (in per cent) of value of agricultural production

Period (in triennium ending)	1962-63 to	1971-72 to	1981-82 to	1962-63 to
Crop	1971-72	1981-82	1990-91	1990-91
Total Cereals	1.84	0.71	5.25	3
Rice	0.11	0.11	5.04	1.73
Wheat	25.98	2.87	6.89	21.28
Total Pulses	-2.3	-1.32	1.53	-0.77
Total food grains	0.89	0.37	4.73	2.13
Total cash crops	9.38	0.24	1.72	4.22
Fruits and vegetables	19.08	0.84	1.08	7.97
Total oilseeds	-0.84	0.08	3.76	0.88
Rapeseed and mustard	0.07	-0.9	9.9	2.61
Miscellaneous and by-products	0.37	0.17	0.08	0.21
Total agricultural production	2.83	0.3	3.03	2.3

Note: For the period 1960-61 to 1980-81 value of paddy is taken into account, whereas for the next ten years the estimates are that of rice.

Source: Calculated from *Statewise and Cropwise Estimates of Value of Output from Agriculture*, CSO, New Delhi.

If we look at the growth of value of agricultural output in the sixties, it appears that this was led by cash crops which grew at an average annual rate of 9.38 percent as against a growth rate of only 0.89 percent in the value of food grain production. Their overall impact however could be little because of very small area under their cultivation. The dismal performance in 1970s was due to an almost stagnant production in all major groups, further aggravated by a negative growth rate registered by pulses. In the decade of eighties, when the value of agricultural production grew at relatively faster rate, it was mostly accounted for by a rapid increase in cereal production growing at an average annual rate of above five percent. The period which saw the onset of Green Revolution in the north-western parts of the country, witnessed a poorer performance in Bihar. The growth rate was depressed to an extent that the decades of 1970s and 1980s taken together experienced a modest

average rate of 1.6 percent per annum as against 2.2 percent in case of India as a whole.⁷ Looking at the compound rates of growth of food grain production in India and in Bihar during 1980s, we find that in Bihar it grew at a relatively faster (as compared to earlier period) rate of 3.1 percent, but was still below the overall Indian rate of 3.4 percent.

These trends in value of agricultural production however, will be influenced by the price movements. To understand the growth dynamics of real output it is necessary to look at the physical production data. To that end the agricultural performance is being looked at in real terms in its decadal decomposition. Keeping in mind the observation that almost all the increase in overall agricultural production has come through yield increments, we proceed to look at the decade by decade story. The detailed charts for individual crops (or group of crops) is given in the Appendix.

The decade of 1960s saw a modest growth experience. Overall agricultural production, heavily dominated by food grain production, grew very moderately. But there was a significant shift in the crop mix. This shift heralded a new pattern of cropping where wheat cultivation started growing very rapidly. Amidst very modest growth of all other major crops, wheat registered a phenomenal increase in all aspects – area, production and yield. The gain of wheat in term of area was a catastrophic loss for pulses, the cultivation of which has not recovered from the decline that it witnessed in the decade of sixties. To a smaller extent, rice also suffered a loss in area. The decisive shift that took place in cropping pattern in that decade is still dominating Bihar agriculture, and can be a serious cause of concern. Overall, this decade's growth performance was heavily influenced by wheat so much so that it saved the state's crop production from a potentially distressing experience.

The decade of 1970s witnessed a downturn in the fortunes of food grain production when it could barely managed to keep the production level from falling from its earlier level. It still remained heavily influenced by growth in wheat production. But

⁷ Triennia average rates, CSO, Govt. of India.

as compared to the last decade, wheat cultivation has lost some sheen and its growth was largely a result of area expansion, and not much coming from yield improvement. Pulses continued their downslide – this time much more pronounced as the loss in area was also accompanied by a lowering of yield. Whereas wheat replaced pulses on more land to keep its production growing, pulse production was shattered in this decade. Alongside, the little diversity that existed in Bihar agriculture also came under further strain when sugarcane cultivation saw a major decline in its area, production, and to some extent in yield level too.

The decade of 1980s saw a moderate revival of food grain production. Not only rice production showed a little improvement in yield (though very little) as compared to the previous decade, wheat production also revived itself by regaining significant yield improvements alongside the continued area expansion. Coarse cereals also managed to grow moderately despite a loss of area under cultivation. Pulse production managed to just stop the downward slide by increasing yield level while the area under pulse cultivation continued to suffer losses. Cereal production as a result, saw impressive growth in production on account of an equally impressive yield improvements. Overall food grain production, increased moderately despite losing area under cultivation. Sugarcane production also saw significant improvement emerging from yield increases. Overall this decade saw a turnaround in agricultural production based on yield improvement after the stressful decade of 1970s.

In the last decade of the century, there was a decline in area under rice cultivation. In fact, the land use statistics has already indicated that this process has started in the decade of 1980s itself when area under cereal cultivation has shown a decline. Cereal production growth also got moderated in this decade because of both factors – decline in area coupled with smaller increase in yield levels. Overall food grain production reflected the same trend with a more pronounced stagnation as pulse production, which saw some improvements in the yield levels in the decade of 1980s, collapsed under a loss of area as well as yield levels. Sugarcane production also

witnessed an all-round decline – in area, production and yield. Interestingly, to compensate for the progressive loss of diversity, vegetable production grew on account of a very impressive increase in yield levels.

By the end of the century, Bihar's agriculture entered a phase of complete downturn. This stagnation was witnessed across all food grain production. Wheat production, that was leading the growth experience so far, stagnated in the first decade of this century. Rice production collapsed experiencing a decline in area, production and yield levels. Overall coarse cereals could barely managed to stay at the levels they had already attained. This was made possible by a very modest growth in maize production. Overall cereal production saw a decline, mostly accounted for by a loss in area, but also possibly a very slight decline in yield levels. Continued downward slide of pulses made overall food grain production also going down. This decline has reached a disturbing low level in the middle of the decade, after which there was a modest and very short lived revival that collapsed again after 2008-09.

The revival and resumption of growth started after 2011 in the present decade. In fact, it turns out to be the best phase of Bihar agriculture as the growth momentum has not only returned, but has picked up pace too. The disaggregated picture also shows some breaks from the past trends. This time it is led by yield improvements of significant scale. This yield improvement is happening outside wheat production, most notably in rice production. Given that rice is the largest grown crop in terms of area, it has a much better potential to improve the overall agricultural prospects of the state. The yield increment is also diversified as yield of coarse cereals, most importantly of maize, has increased impressively. As a result, overall cereal production has shown an impressive performance. Despite the disappointing story of pulse production, this has lifted food grain production to an impressive level, largely driven by significant yield increases, particularly in rice production.

This time pattern of growth has some important elements. First, there is never a sustained long term improvement in agricultural production. It is characterised by both, short term year-to-year fluctuations, as well as longer term swings of growth

and stagnation. Decade of sixties has some growth but it was followed by a distressing decade of 1970s. 1980s witnessed some revival, but yet again it is short lived and is followed by a moderation of growth in nineties. By the end of nineties it goes into a serious decline and is revived towards the end of that decade. The degree of yearly fluctuations is also very high throughout the period.

Second, there appears to be a four-phased growth pattern. A very low growth phase till the beginning of 1980s, then a moderate growth phase till the end of the century, a declining phase since the late nineties, and a phase of relatively rapid growth afterwards. This is shown by the food grain production data that primarily reflects cereal production trends.

Identifying crops leading growth

If we look at different crop groups, we find asymmetric patterns of growth for individual crops within a particular crop group. It is evident that the growth of food grains is essentially led by cereals while pulses registering a negative growth over the entire period. In the case of cereal production, most of the increase can be accounted for by a spectacular increase in the production of wheat which consistently maintained a high growth rate, even in the seventies when all other crops fared badly.⁸ The most important cereal in terms of area as well as value, rice, witnessed relatively better performance during the eighties, otherwise almost stagnating. The other important cereal grown in the state maize, registered a negligible rate of growth. In case of pulses there are contradictory trends for individual crops. Whereas production of all pulses taken together has fallen considerably over the period of three decades, output of *moong*, *masoor*, and to some extent *urad* has increased (*moong* registering a very high growth rate largely due to very small value of

⁸ Initially the production base of wheat as compared to rice was very low which resulted in a very high rate of growth of production of wheat as compared to rice in the sixties. The ratio of wheat to rice production in value terms was roughly 0.10 in 1961-62 (taking triennium average). This ratio grew roughly to 0.35 in 1970-71.

production in the beginning). Production of *gram*, *arhar* and other pulses suffered the most, almost getting halved in the course of three decades.

The major cash crops grown in the state are fruits and vegetables, sugarcane, oilseeds and fibres (mostly *jute* and *mesta*). It is clear from Table 4 that a very rapid increase in the production of fruits and vegetables in the sixties had a significant impact in boosting the overall growth of cash crops. The importance of fruits and vegetables in the group of cash crops has also increased over time so as to constitute about 75 percent of total value of cash crops at the end of eighties from a little over 50 percent in the beginning. Other crops that grew at a relatively appreciable rate are rapeseed and mustard, contributing to most of the modest increase experienced by all oilseeds. The value of production of sugarcane and *gur* has generally fallen only to achieve the initial level by the end of 1980s, though still contributing more than oilseeds and fibres taken together in value terms. But sugarcane production has grown at a rapid rate during the present decade. This increase has come by way of both – area expansion as well as significant yield increases. In fact, the share of area under sugarcane cultivation has more than doubled in the year 2010-11 and has maintained that share afterwards.

The crop wise disaggregation also has some interesting pattern. First, it should be evident that given the overdependence of crop production on food grain production, and within food grain it is cereal production that dominates food grain production, the growth or stagnation in Bihar agriculture is largely a result of individual cereal crop's performance. Till the end of century, when the state's agricultural sector has experienced a modest growth, it was wheat that dominated the trends. Post 1990s, the declining phase was largely caused by a collapse in rice production. The recent revival is also a result of revival of rice production. The picture that emerges from this analysis is that of emergence of a rice-dominated performance. Given that rice has the largest area under cultivation, the centrality of its performance could not be over emphasised.

Second, the overall cropping pattern between major crop groups remains unchanged.

Given this trend, the growth is largely either a result of switching from one crop to another within the same crop group, or a general yield improvement in all crops of a given crop group.

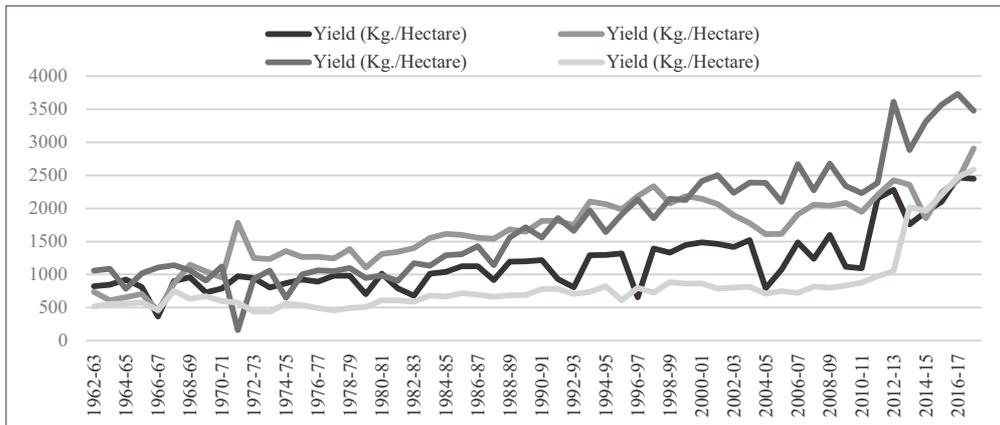
Third, following the second point, if we look at the non-food grain crop groups, it is sugarcane that offers a break from stagnation. Of the recent growth spurt, it is indeed a part of the success story. Oilseed production so far has not produced any growth. Its production, viewed over longer term, remains stagnant for the last five decades with much shorter term variation. Fibre crops also offer not much of hope as they have only grown at the modest rate, mostly in eighties, now showing a declining trend. Vegetable and fruits production in the last fifteen years has grown only very moderately.

Therefore, the picture that emerges from the above analysis of trends is that of heavy reliance of Bihar agricultural performance on food grains, particularly of wheat and rice. Of late, rice cultivation seems to be influencing the overall growth more directly.

As the growth has come to be determined by the yield improvements, it would be interesting to see the time trend of yield levels of different crops. This can be seen from Figures 1 and 2 where comparative yield is plotted for major crops.⁹ These trends may also reveal the growth potential for different groups. In the food grain crops, a general improvement is seen during the current growth phase. At a disaggregated level, it seems that the rice and pulses yield has caught up with the wheat yield that has remained higher for the longer period. Yield level of maize has significantly increased in relation with wheat. The current growth phase therefore, appears more broad-based in terms of crop diversity in the food grain category.

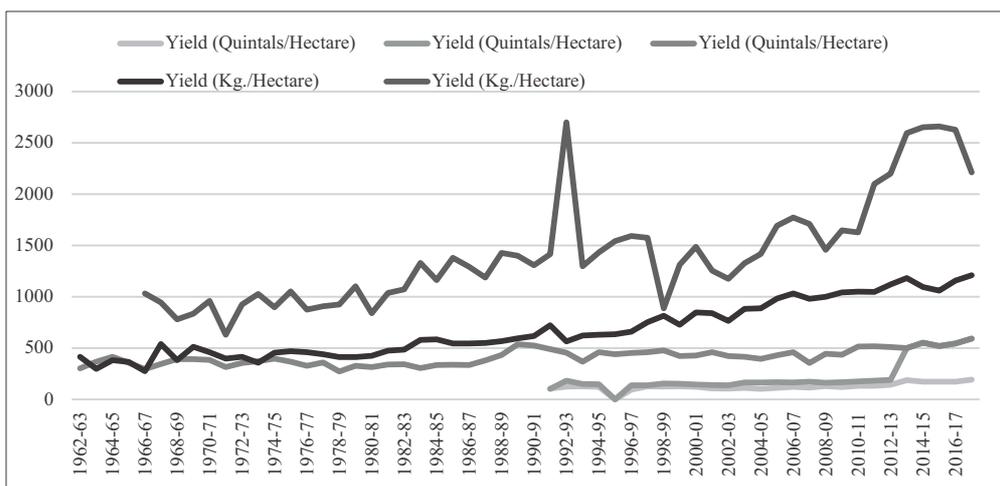
⁹ Source: Directorate of Economics and Statistics, Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture, Government of India.

Figure 1: Yield of major food grain crops



Within the major cash crops category, if we take sugarcane yield as the benchmark, oilseeds and fibre crops have increased their yield levels relatively faster. Recently fruits and vegetables have also registered relatively better performance. Depending upon the possibilities of area expansion of these crops, they offer a faster growth potential. Needless to say, area expansion under these crops would depend on many other factors, if it is not to be jeopardised by vagaries of nature. A lot of those factors would entail government active initiative to materialise the gains.

Figure 2: Yield of major cash crops



A comparative picture of yield level is also useful to make yet another kind of comparison. These yield levels and changes therein can be compared to yield levels of these crops in other states to judge the potential for future growth. A comparison of yield along with the agronomic conditions may reveal potential for further growth that can be targeted.

Nature of agricultural growth in Bihar

From the above discussion, there are few broad observations that can be taken forward. These pointers will help characterise the nature of growth in the state. First, overall the growth performance is very moderate, if not characterised by absolute stagnation. Second, the growth has happened in spurts that remained short lived, not sustaining itself for even two decades even at a moderate scale. Therefore the nature of long term growth in agricultural production has not been that of a unsustainable character. Third, within the long term “swings”, there is a very high degree of year-to-year variability. Fourth, historically cultivation of crops in Bihar was characterised by a domination of few crops. This tendency towards “monoculture” has intensified. Cultivation remains food grain centric. Within the food grain category, it is overwhelmingly cereal dominated. Cultivation of pulses suffered significant loss of area. Fifth, in terms of individual crops, it is heavily paddy-wheat cycle dominated. Even within the paddy category, other variety of paddy has lost over time, leaving *agahani* rice as the most dominant variety cultivated in Bihar. Sixth, recently wheat appears to have reached a plateau in terms of area and yield improvement. Seventh, rice in the current growth phase have gathered some pace by registering impressive yield improvements. Eighth, Sugarcane cultivation has revived itself after three decades of decline and stagnation. Ninth, other cash crops, notably fruits and vegetables, have shown some tendency to increase in yield and production, and offer some potential for sustained growth.

As far as future prospects are concerned, it appears that Bihar has still a lot to achieve in terms of yield improvements, and therefore, this potential remains untapped. But, more importantly, the “monoculture” of Bihar agriculture has to be weakened to

avail itself much of the possibilities of growth by way of diversification in the crop mix. Diversification in the cropping pattern will certainly release some land for cultivation of high value crops. But, given the institutional, economic and physical constraints, it can still only be achieved in the long run. In the immediate sense, the need to improve yield of the dominant crops, particularly of rice, becomes very pressing.

CONCLUSION: NATURE OF AGRARIAN STAGNATION

There have been some discussion on the future course of evolution and the potentialities that can be exploited as far as Bihar's crop cultivation sector is concerned. Government of Bihar (2015), Hoda *et al* (2007), World Bank (2007) and Fujita (2014) are some of the recent contributions emphasising a new direction. But a more grounded understanding of the policies promoting growth have to be located in the actual evolution of cropping trends and its performance. It is important to critically place these understandings in the historical experience of state's agriculture.

The agricultural growth in Bihar appears to be quite dismal. The growth has been modest, it has happened in spurts rather than in sustained phases, its coverage limited in terms of crops. Further, it has been characterised by a high degree of year-to-year fluctuations as well as wide spatial variation in yield levels. The poor land productivity is coupled with even poorer labour productivity that is reflected in an abysmally small amount of value added per capita. This creates the infamous vicious circle: poor yields and productivity generates very small income, low income is mostly devoted towards meeting subsistence needs leaving almost nothing to generate surplus or savings. This leaves the agrarian economy with little or no scope for capital accumulation.

The prospects of future growth seems to be tied with possibilities of yield improvements and its stability. There can be shorter term and longer term policy

goals in this respect. Given the heavy dominance of paddy-wheat cycle, the immediate focus should be on raising the yield of these crops. Importance of yield improvement in paddy cultivation appear more important as it has the largest area under cultivation. Wheat yields in the state appears to be reaching a plateau and further growth requires closer attention to the cultivation conditions, most importantly to irrigation. With the focus on privately owned and controlled ground water based tube well irrigation, the present policy regime has left the private “water markets” to determine the future evolution of irrigation potential, except for the subsidised programme for installation of shallow tube wells. It is necessary to look at the structural aspects within which such private initiatives will be undertaken.

In the longer term, there is a pressing need for crop diversification. The over dependence of paddy-wheat cultivation not only makes agricultural performance hostage to the prospects of these two crops, it also deprives the cultivators of any significant improvement that may arise from cultivation of high value crops. There are signs of emergence of new potential in the form of growing cultivation of some cash crops. If these are not to be a short lived tendency, then every effort should be taken to encourage these by providing necessary institutional support.

Very poor state of agricultural infrastructure holds back future expansion on the suggested lines. Expanding reliable irrigation appears to be the most pressing need of the hour. Some recent initiative in this regard are of relevance. The extension of irrigation cover under the Million Shallow Tube Well scheme has helped bridge the irrigation gap considerably. In fact, it is this part of the minor irrigation schemes that has been relatively more successful in the state. But even this has some limitations. Given that a vast majority of the cultivators are marginal cultivators, their capacity to use tube well irrigation may remain limited despite subsidised installation of tube wells. This is because cost to meet expenses of diesel and distribution channels for widely scattered fields may still remain prohibitive for a large number of cultivators. Further, given the insecure nature of tenancies in the state, tenant cultivators may not like to make even small investments on land and infrastructural improvements.

The alternative route to avail irrigation through private “water market” will have its complexities involved. The social dynamics of villages may hinder development of water markets in an efficient manner. Wood (1994), Shah and Ballabh (1997), and Prasad (2002) have analysed some of these complexities. Local caste and communitarian ties may obstruct a more competitive price formation in these markets. Poor cultivators, placed in a disadvantageous situation in terms of these social ties may not be able to avail irrigation at appropriate time adversely impacting their yield levels.

A much better alternative would be to expand irrigation facilities through public investment that takes care of water distribution problems. Revival of canal irrigation as well as irrigation based on local water bodies have to be given a serious consideration. The environmental impact of indiscriminate use of ground water has already demonstrated very adverse impacts in other parts of country. The same cannot be taken for granted in Bihar even with a satisfactory ground water reserve.

Another crucial aspect of poor infrastructure is very poor state of storage capacity in the state for farm produce. Small cultivators, given their poor resource base are generally forced to sell immediately with no facility to hold back produce when there is a willingness and capacity of doing so. The problem of poor storage capacity is particularly crippling for the relatively bigger cultivators with a marketable surplus. If we look at a comparative picture, in the year 2015-16 the state's share in gross value added in agriculture (measured at current prices) in Indian value added was 3.78 per cent. Roughly a similar share of 3.84 per cent was observed in its share in total cropped area. Compared to this, state's share in storage capacity was a meagre 1.85 per cent.¹⁰ Credit support to tide over these difficulties also seems to be much lower than national average. State's share in total agricultural loans disbursed in the year 2018-19 was just 2.85 per cent, much lower than its share in the number of agricultural holdings that stands at 11.21 per cent according to the Agricultural Census for the year 2015-16. Similarly its share in total amount outstanding under

¹⁰ Calculated from Government of India (2020).

the flagship Kisan Credit Card scheme as on March 31, 2019 was just 2.81 per cent. It was pathetically poor for the cooperative segment of this scheme where its share was a meagre 0.33 per cent. It should be noted that the cooperative banks are much easier to approach for loans and avail credit than other segment of banking sector.

Availability of irrigation and credit, use of other material inputs, labour use pattern and land ownership pattern will largely shape the evolution of agrarian economy of Bihar. What are the opportunities that the present agrarian structure of Bihar offers to agricultural growth – is the central question that is ought to be examined and answered by the policy makers. Given the preponderance of marginal holdings and their subsistence nature, the efforts to increase yields in any case meet a serious limitation. With very low or zero expected profitability, private initiatives are likely to be a non-starter. Without institutional support, it is likely that the existing pattern of stagnation would not only continue, but will dig deeper roots in state's farming sector.

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Appendix Figures

1. Area, Production and yield of some major crops grown in Bihar

