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### HIGH VALUE AGRICULTURE FOR PRO POOR GROWTH



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#### Short Profile

Sarvesh Bandhu is working as an Assistant Professor at Department of Economics in Shri Ram College of Commerce, Delhi University.



#### ABSTRACT:

The purpose of this note is to point out that composition of the agriculture growth has changed significantly. Changing composition is a reflection of the changing economic conditions, composition of demand, and evolving challenges faced by the vast majority of smallholders in India. To sustain pro poor growth in the sector, one has to take into account the possible future drivers of agricultural growth. It is therefore important to understand how policy induced adoption and greater area allocation to high value crops by marginal and small farmers, affect their household food and nutrition security in the long run.

#### KEYWORDS

*Structural transformation, Proliferation, marginalization, average monthly per capita expenditure (MPCE)*

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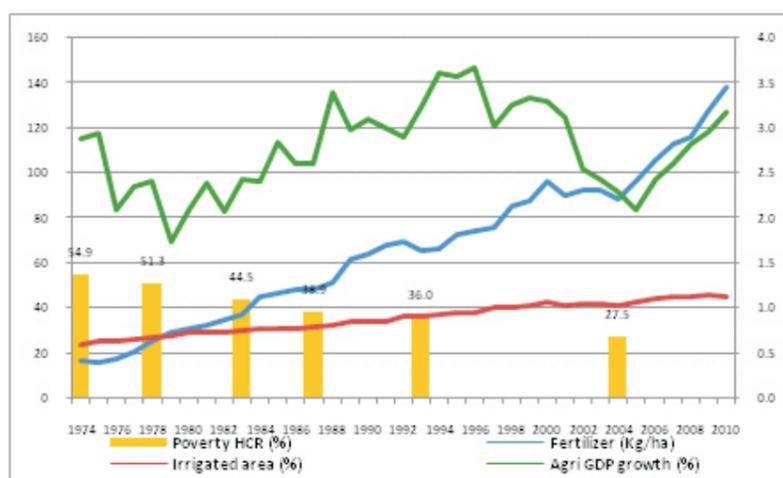
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INTRODUCTION

Indian economy has undergone significant structural transformation in the past four decades. Between 1970-71 and 2011-12, the economy grew at an annual rate of 5.5 % and the share of agriculture in the gross domestic product (GDP) declined from 47 % in the 1970-71 to less than 15 % in 2011-12. Despite a decline in its income share, agriculture continues to be an important sector of the economy. The sector still engages 52 % of the total workforce.

Fuelled by technological change; in terms of increased use of modern seeds, chemical fertilizers and machines; and supported by massive investments in irrigation, infrastructure and institutional developments the agricultural sector grew impressively until the mid-1990s. Agriculture growth peaked in between 1970-71 and 1995-96, reaching growth rate as high as 3.5 % (figure 1). This made country food secure and was accompanied by a significant reduction in poverty. This reinforced the idea across the world that improvements in agricultural growth is important to enhance overall economic growth and reduce poverty.

Figure 1: Technology, agricultural growth and poverty



Source: Irrigation, fertilizer use and agricultural Gross domestic product data from Agricultural statistics at a glance 2012, Ministry of Agriculture, GoI. Head count ratio of poverty from Planning commission, GoI. The growth rate of agricultural gross domestic product calculated on the basis of 10 yearly moving average starting from 1965-66 to 1974-75.

Figure 1 maps agricultural growth and trend in head-count ratio of poverty together with the trends in fertilizer use and irrigated area from 1974 to 2010. This figure in a way summarizes the mechanism through which technological advances (e.g. fertilizer) and public investment (e.g. irrigation) in agriculture have been successful in enhancing agricultural growth in India especially in the decades of 1980s and 1990s, and the social gains of which are visible in declining incidence of poverty. From late 1980s until mid 1990s the agricultural growth reached its highest level, and there was also a significant reduction in poverty during this period. Although rural poverty did respond to agricultural growth, its impact was somewhat dampened by the falling land to labour ratio due to the limited

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absorption of unskilled labour by the non farm sector.

The productivity gains of green revolution have now started diminishing. The productivity of rice and wheat, the major crops that benefitted from technological change, has been increasing but at a slow rate. This has led to slow down in the growth rate of agriculture sector as a whole. This has serious implications for whether the fall in absolute poverty can be sustained in the future. Majority of farm households in India operate on very small scale. This dominance of small scale (tiny land holdings) poses another challenge in increasing agricultural productivity and growth. Technological innovations developed in the western countries, well suited for large farm owners, may not work for Indian farmers. This implies that alternatives have to be found which are tailor made to the needs of small holders endowed with sufficient family labour in comparison of land resources, to revive agriculture growth without affecting their food and nutrition security.

### II.Changing composition of Indian agriculture and rural farm households

Sustainable agricultural growth requires an understanding of the evolution and composition of major drivers of growth. The composition of agricultural sector, especially the crop sector matters greatly for keeping up the momentum of agricultural growth. Changing composition implies that the major drivers of growth may be different in different periods.

**Table 1: Changing composition of agricultural output and growth**

Crops	Share in Value of Output (%)			Annual Growth Rate (%)			Share in Annual Growth Rate (%)		
	1980s	1990s	2000s	1980s	1990s	2000s	1980s	1990s	2000s
Rice	22.4	21.7	19.0	3.3	3.1	-0.2	23.1	20.5	-1.7
Wheat	12.0	12.7	12.6	2.4	5.5	1.2	10.2	20.7	4.6
Maize	2.1	1.9	2.1	0.5	3.1	5.0	0.7	1.9	3.2
Other cereals	5.8	4.1	3.2	-2.7	0.4	1.3	-3.2	-0.2	0.9
Cereals	42.4	40.4	37.0	2.0	3.6	0.7	30.7	43.0	6.9
Pulses	7.3	6.2	5.2	2.6	1.0	3.0	4.6	0.3	4.8
Oilseeds	12.4	14.1	12.1	6.9	-0.7	5.4	21.4	-2.6	13.0
Cotton	3.9	5.0	5.0	1.4	2.8	10.7	4.0	1.7	14.5
Fibers	4.7	5.5	5.4	1.7	2.6	9.9	4.8	1.8	14.7
Plantation	1.7	1.8	1.6	5.6	2.7	5.0	6.8	0.0	1.1
Spices	2.8	3.8	3.9	8.5	6.8	3.8	4.8	5.1	5.4
Fruits	9.4	10.6	14.2	4.4	6.2	5.5	11.3	20.4	24.6
Vegetables	9.8	11.5	13.5	3.6	6.8	6.7	11.0	19.1	28.9
Sugarcane	8.1	8.6	8.8	1.2	5.0	0.0	3.8	13.1	-1.3
Other crops	1.0	0.9	0.9	0.9	1.0	6.8	0.8	-0.1	2.0
All Crops	100.0	100.0	100.0	3.1	3.7	3.3	100.0	100.0	100.0

Source: Value of output data from National Accounts Statistics (various years), GoI. Crops and livestock value of output at 2004-05 prices.

Table 1 shows how the composition of agricultural growth has changed over time. A visible trend is the fall in share of cereals and the increasing share of fruits and vegetables in the total value of output in the crop sector. Cereals, mainly rice and wheat had a significant share in growth in the 1980s and the 1990s whereas fruits and vegetables have turned out to be the major drivers of growth in the 2000s. This is an indication that any policy that is directed towards improving agriculture growth has to factor in the changing composition of agricultural growth in India. This change in composition is a result

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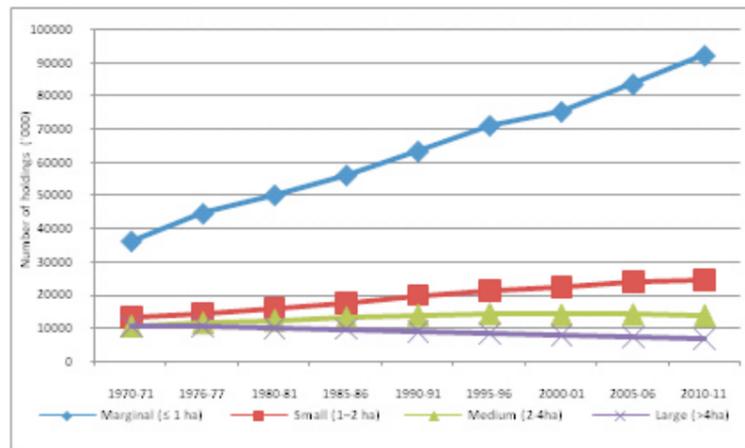
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## HIGH VALUE AGRICULTURE FOR PRO POOR GROWTH

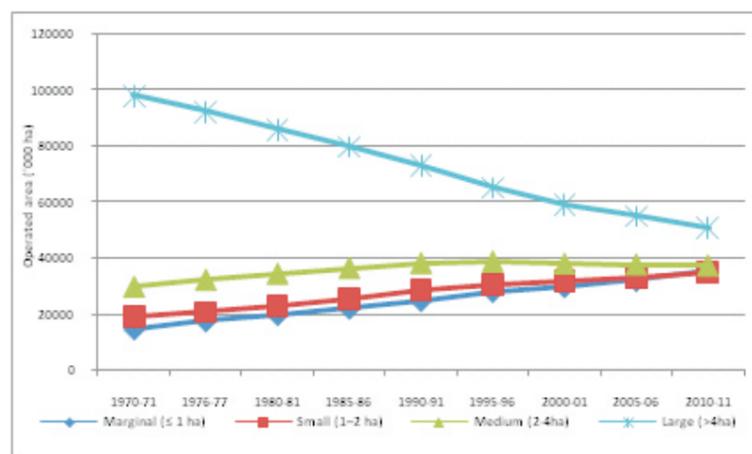
of multitude of factors one of which is the changing composition of demand of the Indian consumers. Rising per capita incomes and urbanisation has led to Indian consumers diversifying their diets towards high value commodities, such as fruits, vegetables, milk, meat, fish and eggs. This compositional change is partly a response to the increasing demand of these commodities. Another reason for the rising importance of high value commodities in Indian agriculture may be the smallholder bias in production of these commodities. Due to its bias towards the highly skilled and the educated, India's non farm sector has not been able to reduce the excessive population pressure on the agricultural sector (Figure 2). Figure 2, panel (a) and (b) shows the significant proliferation of marginal landholdings and the decline in large farms (> 4 hectares) over time in India. This has happened to the extent that the average size of operated area has fallen down from 2.28 ha in 1970-71 to 1.16 in 2010-11. This has serious consequences for the potential of economic growth to trickle down to the marginalized poor farm households.

**Figure 2: Proliferation and marginalization of land holdings**

**(a) Number of holdings by farm categories**



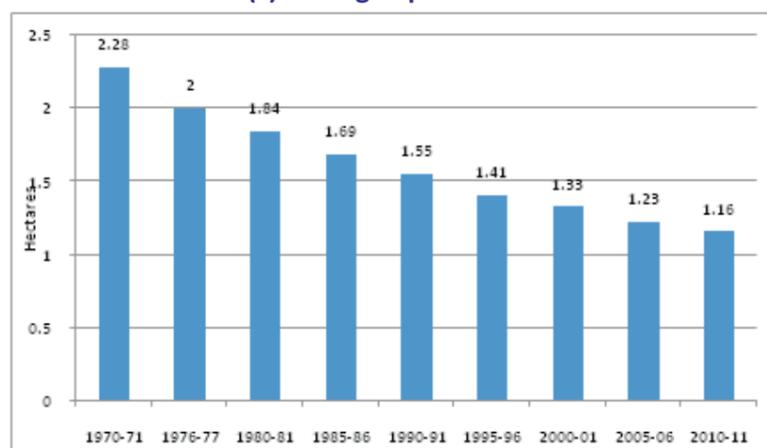
**(b) Total area under different farm categories**



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(c) Average operated area



Source: Agricultural census 2010-11, All India Report on Number and Area of Operational Holdings, Ministry of Agriculture, GoI, 2012.

According to the latest agricultural census, two thirds of the landholdings are of 1 ha or less (average size of 0.38 ha) (table 2). Viability of such tiny holdings as a main source of livelihood for farm households is in question. With such a skewed distribution of landholdings, marginalised farmers may not be able to benefit much from economic growth. Low inequality in the initial distribution of landholdings is an important factor in agricultural growth being pro poor. Low inequality in initial distribution of assets has been proven to be an important factor in the economic growth to trickle down to the poor. With poverty mainly concentrated among the small farm households, the ability of (traditional) crop production in ensuring food and nutrition security and pushing them out of poverty is in question. In order to promote inclusive agricultural growth one needs a reassessment of the characteristics of the rural farm households in India. Compositional changes in agricultural sector at a macro level are partly driven by the changing conditions, situation and decision of individual farm households at the micro level.

Table 2: Selected characteristics by farm size in India

Characteristic	Marginal (= 1 ha)	Small (1-2 ha)	Medium (2-4ha)	Large (>4ha)
Share in Landholdings (%)*	67.04	17.93	10.05	4.98
Share in area (%)*	22.2	22.1	23.6	32.1
Average farm size (ha)*	0.38	1.42	2.71	7.45
Irrigated area (%)	58	47	45	42
Cropping intensity (%)	142	130	126	126
Area HYV (%)	75	70	67	60
Fertilizer use (kg/ha)	198	167	137	109
Households availing institutional credit (%)	20	33	35	39

Source: All India Report on Input Survey, 2006-07, Department of Agriculture and Cooperation Ministry of Agriculture, 2012. \* Data from Agricultural census 2010-11, All India Report on Number and Area of Operational Holdings, Ministry of Agriculture, GoI, 2012.

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The marginal farm households control only 22 % (table 2) of the area in India. Due to their small size of operational landholdings, they practice intensive agriculture with highest irrigation and fertilizer usage. Access to institutional credit is lowest among marginal farm households.

**Table 3: Area shares of different crops by size categories of farms (%)**

Crops/crop groups	Marginal	Small	Medium	Large	Total
Rice	38.09	31.14	24.76	15.13	26.67
Wheat	20.90	17.21	15.83	14.16	16.92
Maize	5.66	5.45	4.38	2.89	4.50
Other cereals	9.26	12.85	14.76	17.69	13.82
<b>Total cereals</b>	<b>73.90</b>	<b>66.64</b>	<b>59.73</b>	<b>49.87</b>	<b>61.90</b>
Pulses	6.58	9.53	10.96	16.01	11.04
Oilseeds	6.20	8.31	12.13	15.44	10.78
Fiber crops	2.01	3.64	5.05	6.87	4.51
Sugar crops	2.20	3.30	3.47	2.88	2.93
Fruits	1.12	1.20	1.37	1.06	1.18
Vegetables	4.03	3.08	2.06	1.24	2.54
Spices	1.05	1.00	1.24	1.13	1.11
Plantation	0.98	0.70	0.52	0.49	0.67
Flowers	0.09	0.05	0.13	0.03	0.07
Medicinal and narcotic plants	0.20	0.27	0.39	0.16	0.25
<b>High-value crops</b>	<b>7.46</b>	<b>6.29</b>	<b>5.71</b>	<b>4.11</b>	<b>5.81</b>
Other crops	1.65	2.28	2.96	4.82	3.03

Source: NSSO 59th round schedule 33, Situation Assessment of Farmers in India, 2005.

Marginal and small farmers operate at a subsistence level, allocating more than 70 % (table 3) of the area to the cultivation of cereals to ensure their food security. In comparison, large farmers devote lesser area to cultivation of cereals and focus more on pulses, oilseeds and fibers. Among the four categories of farm households, marginal farmers dominate in allocating area to high value crops (7.5 %), such as fruits, vegetables, spices, plantations, flowers, medicinal and narcotic plants. This implies that there may be a smallholder bias in cultivation of these high value commodities. On the face of it, this seems perplexing. High value crops have high risk and may require greater investment and technological knowhow. Then why is it that marginal and small farmers lacking access to basic institutional and non institutional resources, still prefer to grow high value crops. The answer may lie in the fact that due to greater labour resources available with the marginal and small farmers they practice intensive agriculture, and are in general more productive in comparison to large farm households (table 4). With greater supervision and a higher level of motivation, since their livelihood and sustenance is at stake, they can mitigate the risk associated with high value agriculture. High value crops such as vegetables are of short duration and generate regular incomes. These can also create an avenue for sustainable intensification of agriculture, increased employment, and help farmers avail benefits from market opportunities.

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Table 4: Net returns per hectare from different crops (Rupees/hectare)

Crops/crop groups	Marginal (=1.0ha)	Small (1.0-2.0ha)	Medium (2.0-4.0ha)	Large (>4.0ha)	All
Rice	8594	8394	8919	9313	8734
Wheat	9497	9108	10614	9736	9711
Maize	4781	4769	4604	5140	4807
Other cereals	3375	3287	2415	2039	2611
<b>Total cereals</b>	<b>7903</b>	<b>7298</b>	<b>7444</b>	<b>6611</b>	<b>7349</b>
Pulses	5248	4393	5031	4187	4579
Oilseeds	8738	6759	6395	6150	6694
Fiber crops	7639	6999	7784	5731	6697
Sugar crops	22627	17780	23139	21279	21186
Fruits	32687	21004	19243	14881	21715
Vegetables	14182	12686	11752	12592	13103
Spices	21288	19340	18035	13061	17557
Plantation	23355	19678	18665	11449	19049
Flowers	20667	9508	10896	11585	13925
Medicinal and narcotic plants	13684	16822	14303	12351	14386
<b>High-value crops</b>	<b>19220</b>	<b>16250</b>	<b>15699</b>	<b>13159</b>	<b>16444</b>
Other crops	12421	10363	8622	4230	7350
<b>All crops</b>	<b>9018</b>	<b>7944</b>	<b>8120</b>	<b>6668</b>	<b>7877</b>

Source: NSSO 59th round schedule 33, Situation Assessment of Farmers in India, 2005.

The higher intensity of agriculture practiced by marginal and small farm households is reflected in the net returns per hectare. Although much debate has been centred on the existence of inverse size productivity relationship, table 4 shows some evidence that inverse size productivity does exist in Indian agriculture. Marginal and small farmers earn significant higher returns than do the large farm households. Table 4 also gives suggestive evidence of the driver of this size productive relationship. The inverse relationship seems most prominent in the case of high value commodities as compared to the staples, rice and wheat. At the risk of drawing too much conclusion, it can be said that whatever may be the historical reasons for the inverse size productivity relationship, it seems as if in India it is largely driven by the smallholder bias in cultivation of the high value commodities. What is evident from this analysis is that farm households in India have already started responding to changing structure of economy and growth. A refocus from traditional crops to a more diversified crop portfolio can be considered as an adaptive response of farmers to the structural changes witnessed by the Indian economy with limited opportunities out of agriculture to industry or services. Diversification of agriculture out of staples towards high value crops therefore, becomes important to improving incomes and employment opportunities for the poor.

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**Table 5: Monthly per capita consumption expenditure (rupees) and poverty status of farm households 2002-03**

Classes	Average MPCE	Fraction poor based on Head-count ratio	Poverty gap	Squared poverty gap
<b>Land holding class</b>				
Marginal	467	0.294	0.054	0.015
Small	522	0.194	0.032	0.008
Medium	558	0.160	0.028	0.008
Large	645	0.098	0.016	0.004
All	504	0.242	0.044	0.012
<b>Non-HVC growers</b>	<b>487</b>	<b>0.255</b>	<b>0.046</b>	<b>0.013</b>
<b>HVA growers</b>				
Quartile 1	521	0.218	0.036	0.009
Quartile 2	543	0.199	0.036	0.011
Quartile 3	564	0.191	0.032	0.009
Quartile 4	641	0.151	0.029	0.008
<b>All growers</b>	<b>559</b>	<b>0.196</b>	<b>0.034</b>	<b>0.010</b>

Source: NSSO 59th round schedule 33, Situation Assessment of Farmers in India, 2005.

Diversification, thus, presents an opportunity especially for small farmers to utilize their surplus labour and enrich farm incomes. With this in mind it is pertinent to assess the impact of greater diversification on the food and nutrition security and welfare of farm households. Table 5 presents the average monthly per capita expenditure (MPCE) and poverty status for farm households. The incidence of poverty is higher among farm households with smaller operated area. 29.4 % among marginal farmers and 19.4 % among small farmers, as compared to 9.8 % among large farm households. In addition to the head-count ratio, table 5 also presents poverty gap that measures depth of poverty (how far households are from the poverty line) and squared poverty gap that measures severity of poverty (besides poverty gap it takes into account the inequality among the poor). Diversification may not help all the poor to come out of poverty, but may mitigate its severity and reduce the poverty gap. Both poverty gap and squared poverty gap become smaller with increase in farm size. Table 5 also highlights differences in consumption expenditure and poverty measures for growers and non-growers of high value crops. Consumption expenditure for growers of high value crops is about 15 % higher than that for non-growers. The incidence of poverty as well as the depth and severity of poverty are also lower among the farmers growing high value crops. A comparison of poverty measures across quartiles of the growers of high value crops (based on area share) indicates a positive relationship between intensity of participation in production of high-value agriculture and household welfare.

### III.CONCLUSION

The above analysis, although suggestive, points out that diversification towards high value agriculture is one possible way of sustaining agricultural growth, utilizing the dominance of smallholders as a main instrument of achieving twin goals of, sustainable agricultural growth and reduction in the incidence of poverty among smallholders. In the cultivation of high value crops the comparative advantage lies under conditions of scarce land and abundant labour. These conditions characterize the resource endowments of poor farmers. Adoption of these crops and their

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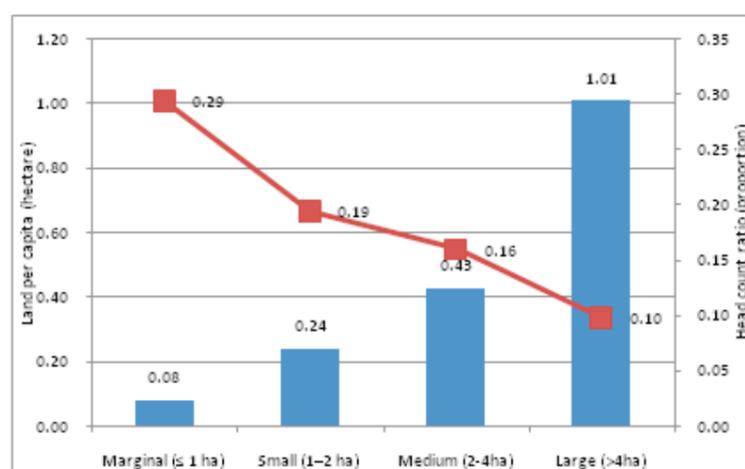
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intensification could, thus, potentially impact farm poverty.

There is hardly any research exploring the relationship between diversification through high value agriculture and improvement in welfare of marginal and small farmers. Marginal and small farmers operate at subsistence level and their decision of crop choice and acreage allocation is arrived at by factoring in their food and nutrition security. Due to small scale of operation their dependence on land is high (figure 3).

Figure 3: Operated land per capita and head count ratio by land holding classes.



Source: NSSO 59th round schedule 33, Situation Assessment of Farmers in India, 2005.

It is therefore important to understand how policy induced adoption and greater area allocation to high value crops by marginal and small farmers, affect their household food and nutrition security in the long run. Any research focussing on high value agriculture as a possible driver of pro poor growth has to first rigorously establish the positive effects of adoption of high value crops on net earnings and welfare of farm households. Detailed household level panel data cataloguing the cropping pattern and production decisions, value of output along with information on various other aspects of the households is required to analyze the welfare impacts of high value agriculture on household welfare. If established, then research has to answer the question of optimal area to be allocated by farm households, which can have maximal welfare returns without competing with food and nutrition security of the households.

As the pace of decline in poverty slows down, it becomes vital to sustain pro poor growth in agriculture. One has to look for new sources to revive the growth successes of the green revolution period. Diversification to high value agriculture seems to be one promising instrument towards that end. But rigorous research needs to support the argument, establish the channel through which high value agriculture will improve welfare and reduce poverty, and assess its long term impacts on the food and nutritional security.

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