Explaining the Rise in Agricultural Prices: Impact of Neoliberal Policies on the Agrarian Economy

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Abstract

The international prices of agricultural commodities have exhibited a rising trend since the mid-2000s. This article explains the phenomenon using demand–supply framework from a macroeconomic perspective. It does not find any evidence in favour of the mainstream argument of increased demand from India and China being responsible for this price rise. It argues that the pursuit of neoliberal policies have squeezed the earnings of the peasantry and made agriculture an unviable occupation, adversely affecting its supply. During 1995–2004, the annual per capita production of cereals in the world declined at an alarming rate of 0.32 per cent and then over 2005–2012 grew at a meagre rate of 0.85 per cent, respectively. The production of biofuels, using food crops as feed, has further distorted the international food market. Moreover, speculative activities in the futures market fuelled the existing tendencies of rising prices. If sufficient policy support is given to the agrarian economy of developing countries, then this phenomenon can be reversed.

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Keywords

Agricultural commodity prices, food prices, price rise, neoliberalism, demand–supply, biofuels, speculation

Introduction

The international prices of agricultural commodities have exhibited a rising trend since the middle of last decade. The pace as well as the magnitude of these increasing prices had not been experienced in recent history; it was last felt in the early 1970s. It is common knowledge now that international commodity prices are extremely volatile in nature and that booms and busts are relatively common occurrences in this market. A few incidents of sharp increase in commodity prices are dotted over the last century—the two such crucial periods being 1915–1917 (World War I) and 1973–1974 (first oil crisis). However, this present episode has surpassed all these previous episodes of the last century in magnitude and duration (World Bank, 2009, pp. 3–5).

The International Monetary Fund (IMF) price index of internationally traded commodities (including energy) increased by 204.03 per cent from January 2001 to January 2012, and non-fuel primary commodities increased by 115.12 per cent over the same period. In Figure 1, it is

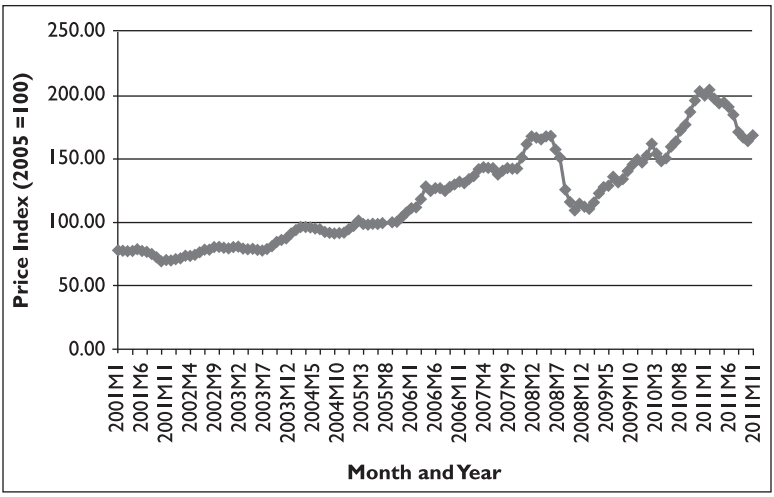

Figure 1. Index of International Non-fuel Primary Commodity Prices, January 2001 to January 2012 (monthly)

Source: IFS-CDROM, IMF (2012).

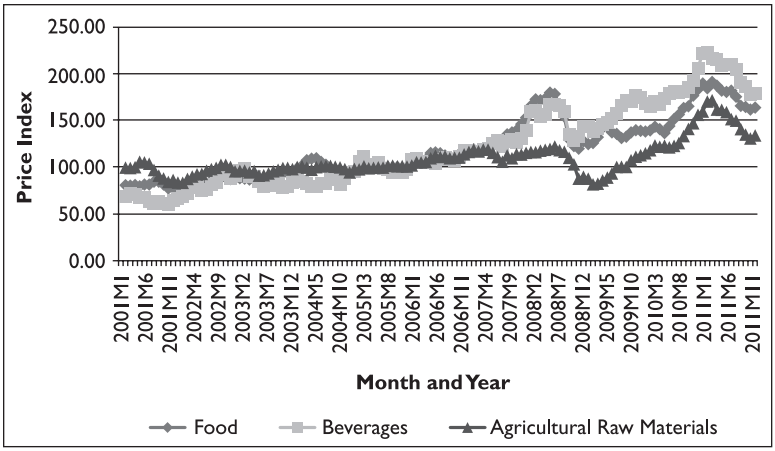

Figure 2. Index of Different Subgroups of Agricultural Commodity Price Index, January 2001–January 2012 (monthly)

Source: IFS-CDROM, IMF (2012).

evident that the non-fuel price index steadily increased from 95.42 in January 2005, to reach a peak of 168.81 in July 2008, thereafter declining gradually to 110.1 in December 2008. It is also evident that this index again started to accelerate from the initial phase of 2009 until April 2011, thereafter experiencing a trivial downfall. Among food commodities, the IMF price index of beverages increased by 87.0 per cent over the period January 2005 to January 2012. By contrast, the price index of agricultural raw materials increased only by 36.60 per cent. It is obvious, from Figure 2, that most alarming is the sharp rise in food prices. The price index of food commodities increased by almost 71.12 per cent from January 2005 to January 2012.

This upsurge in the agricultural commodity prices, especially those of food grains, has been a matter of major concern for the global economy, in particular the developing ones (Kwame, 2010). Therefore, it becomes extremely important to analyze in details this phenomenon of rising prices in agricultural commodities.

This article is planned as follows. In the following section, we try to look at the factors responsible for this episode of price rise of agricultural commodities and, in particular, food prices. The mainstream argument that increased consumption of developing countries, such as, India and China, is responsible for the price hike has been countered with empirical evidence. In the third section, the article puts forward and substantiates its own argument that this rising trend is an outcome of the pursuit

of neoliberal economic policies. These policies have impeded the production conditions by aggravating the distress of the peasantry and small farmers and made simple reproduction difficult in the agrarian sector. It also argues that the recent phenomenon of increased production of biofuels, using food crops as feed, further distorts both demand and supply in the international market. The last subsection argues that the increased financialization in the neoliberal era encouraged speculation in commodity futures and acted as a positive catalyst in aggravating the situation. This article concludes on an optimistic note that proper policy support to the agrarian sector and a reversal of neoliberal policies can control this price rise in the global economy and ease the pressures on the already accentuated global food crisis.

Increasing Demand for Food Grains from India and China: Is this a Valid Reason?

In April 2008, the US government advanced an argument that dietary changes and increased food intake in India and China are responsible for this recent hike of food grain prices in the world economy. Some popular books and international reports also documented such a possibility (Brown, 1995; HLPE, 2013). According to this theory, several years of rapid growth in these heavily populous developing nations have led to an increase in the income level, which in turn has increased the aggregate demand for food. It has been argued that as per capita income in these countries increases, the absolute level of aggregate demand for food grains rises, even though the incremental spending of people on food items out of their increased income is low. For instance, Trostle (2008, pp. 8–9) points out that the increase in population size in developing countries, such as, India and China, amplifies the demand for food grains and also that these countries have a rapidly rising income that again adds to the overall demand.

However, in reality, the per capita level of consumption of cereals in India and China is much lower than the world average, and even those of United States itself. By consumption here we mean both direct use of cereals as food and indirect use as fodder for production of meat, poultry and milk, such that the impact of dietary change is also captured. The average consumption of cereals in the world is 80 per cent higher than in India and 10 per cent higher than in China (Chand, 2008, p. 118). This implies that, on average, the consumers in these countries consume

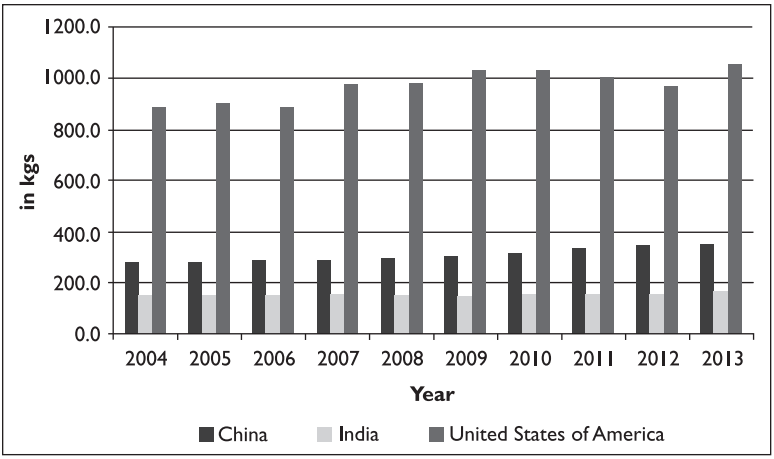

Figure 3. Per Capita Domestic Consumption of Major Cereals in China, India and USA, 2004–2013

Source: Author's calculations based on domestic consumption data taken from World Agricultural Supply and Demand Estimates, USDA publications, retrieved 21 May 2015, from http://www.usda.gov/oce/commodity/wasde/ and population data taken from World Development Indicators, World Data Bank, retrieved 21 May 2015, from http://data.worldbank.org/data-catalog/world-development-indicators

Notes: a) The total domestic consumption of major cereals is calculated by adding up individual levels of consumption of cereals in each country and then dividing it by the corresponding population data to estimate the per capita figures.
b) Major cereals include wheat, rice and corn.
c) 'kgs' denotes kilogrammes.

much less of cereals as food and feed than an average consumer in the world economy. In Figure 3, it is evident that over the entire period of 2004–2013, the per capita domestic consumption of cereals in the United States was significantly higher than that of China and India. This is primarily because the indirect consumption of cereals, in the form of meats and eggs, is at a higher level in the United States. For instance, the average meat consumption in the United States in 2004–2006 was 126.6 kg, which was around 86 kg higher than the world average (Chand, 2008, p. 118). Even if the argument that higher levels of consumption have led to a hike in agricultural prices is assumed to be true, then the share of responsibility would be much more on a developed economy, such as, the United States, than on any other developing country, such as, India or China.

Moreover, even if one looks at food statistics within India and China, there is no evidence that total food intake increased over the

Table 1. Exponential Growth of Food Availability in China and India

	China		India	
	1990–1999	2000–2009	1990–1999	2000–2009
Cereals (excluding beer)	1.93	0.63	1.87	1.30
Starchy roots	3.50	−1.89	3.19	4.62
Pulses	4.22	−2.25	1.02	2.73
Vegetable oils	6.80	7.77	6.20	3.97
Vegetables	9.58	4.06	3.44	2.52
Fruits (excluding wine)	13.60	6.33	5.92	6.22
Meat	8.30	2.56	0.89	2.90
Fish, seafood	9.95	2.78	4.26	3.80

Source: Author's calculations based on the FAO's Food Balance Sheet, FAOSTAT, retrieved 21 May 2015, from http://faostat3.fao.org/browse/FB/FBS/E

decade of 2000–2009, when the food prices were actually rising, compared to the earlier one (1990–1999). To compare the consumption levels over the two periods, 1990–1999 and 2000–2009, we computed the exponential growth rates of total food availability (Table 1). In both countries, India and China, the annual growth rates of cereal consumption (excluding beer), vegetables and fish and seafood experienced a decline in 2000–2009 compared to 1990–1999. However, in the case of India, there has been an increase in high-value food categories, such as, fruits (excluding wine) and meat. Indeed, for a country such as India, it is true that the rich and neo-rich middle class has shifted its dietary pattern and is consuming, directly and indirectly, more food grains per capita. However, this argument is not valid for the Indian population as a whole. The per capita absorption of food grains, both direct and indirect, in India for the population as a whole has been actually lower than it used to be even a decade earlier (Patnaik, 2007).

The other important factor that needs to be accounted for is whether the consumption of food grains, especially cereals, by India and China in any manner unsettled the international food grain market through trade-related activities. China actually imported fewer cereals in the 2000s than in the 1990s. On the other hand, India, except for 2006, had been a net exporter of cereals in the world market over this entire period (Figure 4). During the last decade, the export of cereals by India has increased from 2.67 million metric tons to 5.04 million metric tons. Thus, from the above observations, one can argue that holding India and

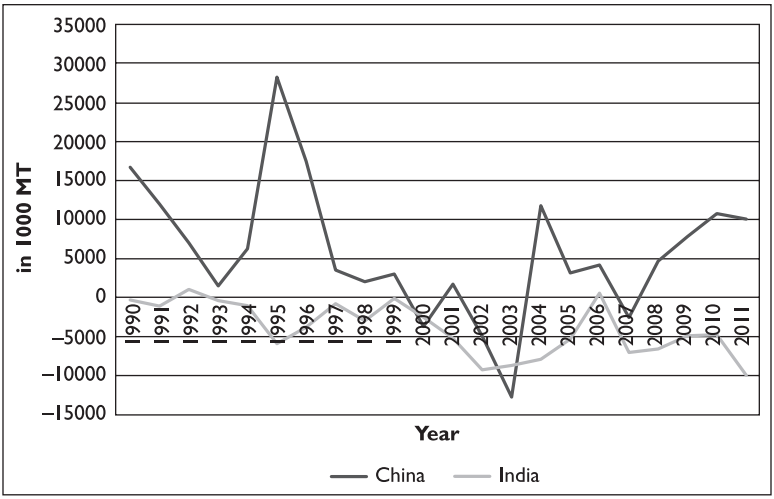

Figure 4. Net Import of Cereals (Excluding Beer) in China and India, 1990–2011

Source: FAO's Food Balance Sheet, FAOSTAT (2013), retrieved 21 May 2015, from http://faostat3.fao.org/browse/FB/FBS/E

China responsible for this colossal price rise, in reality, reflects the lack of knowledge regarding the actual scenario of food consumption in these developing countries and also the limited impact they have on the international market. Therefore, from their perspective, it becomes additionally significant to identify the factually correct explanations of rising food prices.

Impact of Income Deflationary Policies on the Agrarian Sector

In the literature, it is argued that short-term movements in prices of agricultural commodities are usually caused by demand–supply imbalances, since these prices are mainly demand–supply determined. Following Kalecki (1971), one can then further argue that fluctuations in international prices of food and other agricultural commodities can arise from demand–supply imbalances in the international commodity market. It will be argued here that there might be situations in which long-term macroeconomic policies adversely impact on both the supply and demand of agricultural commodities, causing a demand–supply imbalance in the market, which causes a

drift in their prices. In this section, we try to envisage such a situation in which long-term macroeconomic policies have resulted in a sharp rise of agricultural prices in the recent past.

With the pursuit of neoliberal reform policies since the early 1980s, more than 90 developing countries adopted, over various sub-periods, a virtually identical package of economic policies, labelled 'economic liberalization, stabilization, and structural adjustment', commonly known as the Washington Consensus, under the diktat of international lending agencies, such as, the IMF and the World Bank. These policies have been forced upon the developing countries as an obligatory condition for borrowing from these lending agencies in order to finance their external deficit. Some of the common elements of the neoliberal economic policy consist of pursuing a very tight fiscal and monetary policy, causing a sharp domestic deflation, cutting food and social sector subsidies, scaling down protection to small-scale industry and encouraging consumer goods imports (via trade liberalization), devaluation and export promotion. Although the degree of implementation has differed, some of the long-run measures have included opening up the economies to the free inflow and outflow of foreign capital; privatization of public sector enterprises including the financial sector; removal of exchange controls and, eventually, full currency convertibility; and, in the agrarian sector, encouragement of agro-exports and commercial agri-business as well as removal of barriers to foreign companies holding land (Patnaik, 1999, pp. 353–354). The nature of these demand deflationary policies has been elucidated in a report prepared by the IMF to evaluate the structural adjustment programme (SAP) followed by 78 indebted developing countries under its own supervision during the 1980s (Table 2).

One of the immediate consequences of implementing these reform policies was a decline in the growth rate of net capital stock formation in the agricultural sector. The decline in public investment in the

Table 2. IMF-supported Programmes in 78 Countries in the 1980s

Type of Policy	In Percentage Terms
1. Restraint on Central Government Expenditure	91
2. Limits on Credit Expansion	99
3. Reduction in Ratio of Budget Deficits to GDP	83
4. Wage Restraint	65
5. Exchange Rate Policy (Devaluation)	54

Source: Reprinted from Patnaik (1999, p. 355).

agricultural sector, due to restraints on Central Government expenditure and limits on credit expansion, led to a global slowdown in the overall growth rate of agricultural investments. The global annual growth rate of agricultural investments on land development and machinery and equipments declined from 1.22 per cent to 0.42 per cent and 1.89 per cent to 0.33 per cent, respectively, over the two periods from 1980–84 to 2000–07.[1]

The ubiquitous pursuit of demand-deflationary policies and declining levels of investment resulted in the massive income deflation of the masses. Such a phenomenon of income deflation not only suppressed the money wage rates in these economies but also affected the level of employment and income, especially in the non-capitalist, petty production and agricultural sectors. As discussed in the literature, there are at least three processes, in a comprehensive sense, contributing to this phenomenon of income deflation, particularly in developing countries. The first is a relative reduction in the scale of government expenditure, especially welfare expenditure, transfer payments to the poor, public investment expenditure and development expenditure in the rural areas, which severely contracts the purchasing power of the masses (Patnaik, 2008, p. 109). Second, the domestic petty producers and peasantry in the Third World countries are exposed to free competition with big capitals in the metropolitan areas, which eventually leads to a destruction of small-scale production in the former and affects the rural economy and sectors, such as, agriculture. This was done mainly through trade liberalization, which is an essential component of this neoliberal process; in particular, a relentless effort has been undertaken to dilute import controls by reducing the number of tariff items subject to quantitative restrictions, licensing and other forms of discretionary controls on imports (Chandrasekhar & Ghosh, 2000, pp. 24–25). Finally, the third process through which income deflation is effected has involved the secular shift in the terms of trade themselves against the petty producers and peasants producing agricultural commodities. Prior to the current episode of price rise, the real prices of staple foods were at an all-time low (Headey & Fan, 2010, p. 12).

Let us further elaborate on the impact of demand deflationary policies on agrarian prices through a simple theoretical illustration. Hypothetically, one can think of a mechanism through which supply–demand balances in the agrarian sector can be maintained in the long run even for lower values of terms of trade. In other words, at different levels of real prices of agricultural commodities in the long run, there can be an equilibrium rate of growth of supply and demand. Here, we make an

attempt to explain this mechanism through a dynamic equilibrium model in which the rate of growth of supply adjusts to the rate of growth of demand in the agricultural sector over the long run.

Suppose we assume that there is an equilibrium rate of profit (r^*), at which there is an equilibrium achieved between the rates of growth of supply (s) and demand (d) in agrarian sector. We further assume that the rate of growth of demand for these commodities is exogenously given.[2] Now, if the rate of profit (r) in this agricultural commodity-producing sector exceeds that equilibrium rate of profit (r^*), then the rate of growth of supply (s) exceeds the rate of growth of demand (d). Conversely, if the rate of profit is less than the equilibrium rate of profit, then the rate of growth of supply will be lower than the rate of growth of demand. It follows that if the rate of profit equals the equilibrium rate of profit, then the rate of growth of supply adjusts to the autonomous rate of growth of demand in the agricultural sector.

Similarly, demand–supply imbalances can get eliminated in the long run with the rate of growth of supply equalizing the rate of growth of demand through a self-adjusting mechanism in the agrarian economy, which drives the rate of profit to its equilibrium. Suppose, the rate of profit is higher than the equilibrium rate of profit. This will lead to an increase in the rate of growth of supply over the rate of growth of demand. In the long run, such an excess supply will in turn tend to reduce the profit margin, thus pulling down the rate of profit to its equilibrium value. Conversely, if the rate of profit is lower than its long-term equilibrium value, then an excess demand for commodities will tend to push up the rate of profit to its long run equilibrium value (Figure 5).

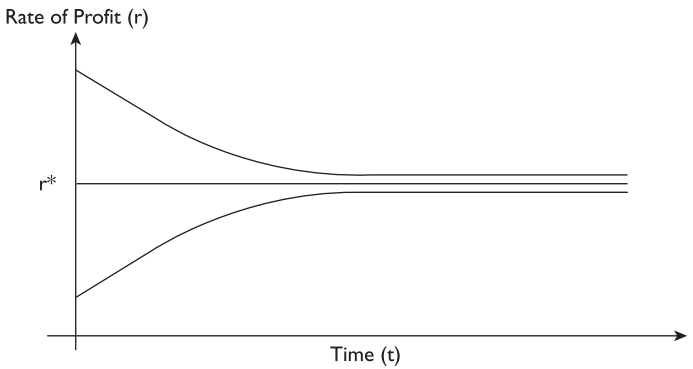

Figure 5. Time Path of the Rate of Profit

Source: Author's own.

By this mechanism, in the long run, the rate of profit in the agricultural sector will be always equal to its equilibrium rate of profit and thereby eliminate any demand–supply imbalances in this sector.

Mathematically:

Suppose, in the agricultural sector, the rate of growth of demand is d_t and the rate of growth of supply is s_t at a time period t. Then, we can say that:

$$(s_t - d_t) = a.(r_t - r*), \tag{i}$$

where r_t is the rate of profit, $r*$ denotes the equilibrium rate of profit and a denotes some arbitrary constant such that $a > 0$.

The change in the rate of profit over time can be written as:

$$dr/dt = b.(d_t - s_t), \tag{ii}$$

where dr/dt denotes the change in the rate of profit with time and b denotes some arbitrary constant such that $b > 0$.

Now, if $s_t = d_t$, then $r_t = r*$, that is, at the equilibrium rate of growth of demand for and supply of agricultural commodities, the rate of profit in this sector equals the equilibrium rate of profit.

Now, if $s_t \neq d_t$, then

$$dr/dt = -b.(s_t - d_t)$$

or, $dr/dt = -ab\,(r - r*)$ {substituting from equation (i)}

or, $dr/dt = abr* - abr$

or, $dr/dt = c - n.r$,

where $c = abr*$ and $n = ab$.

Therefore, if $s_t > d_t$, then $dr/dt < 0$, that is, the rate of profit will tend to fall to the value of the equilibrium rate of profit over time, or if $s_t < dt$, then $dr/dt > 0$, that is, the rate of profit will tend to rise to the value of the equilibrium rate of profit in the long run.

In the real world, with the pursuit of the income deflationary policies since the early 1980s, there has been a decline in the rate of growth of demand for agricultural commodities, which eventually suppressed the rate of growth of supply. We assume the low rate of growth of demand to be δ, such that its value is even lower than the rate of growth of population (η) in the world economy. In the long run, the rate of growth of supply (ξ) in agricultural sector, too, attains this low value with supply adjusting

to demand at some equilibrium rate of profit (r^*). This essentially means that the per capita output of agricultural commodities, especially food grains, in the global economy began to decline over time as the growth rate of production became lower than the population growth rate.

Symbolically,

$$\xi = \delta < \eta. \tag{iii}$$

Such an analysis of the world economy is entirely in congruence with reality when one looks at the evidence. The annual per capita production of cereals in the global economy has remained stagnant over nearly three decades, spanning 1985–2013, growing annually at a paltry rate of 0.05 per cent. Figure 6 provides a visual description of this stark observation. However, this entire episode can be divided into two distinct periods of a declining trend in 1985–2003 and a recovery thereafter. During the former period of nearly two decades, the total per capita production of cereals declined from 375.6 kg per annum to 330.3 kg per annum, at an annual rate of 0.52 per cent. This episode of declining per capita production was also associated with a decline in the real prices of food commodities over the period 1990–2003. During this period, the

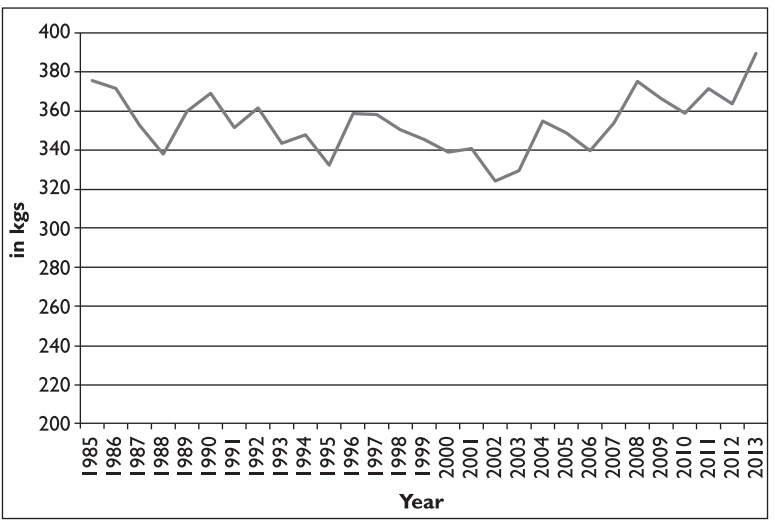

Figure 6. Annual Per Capita Production of Cereals in the World Economy, 1990–2012

Source: FAOSTAT, retrieved 14 May 2015, from http://faostat3.fao.org/download/Q/QC/E

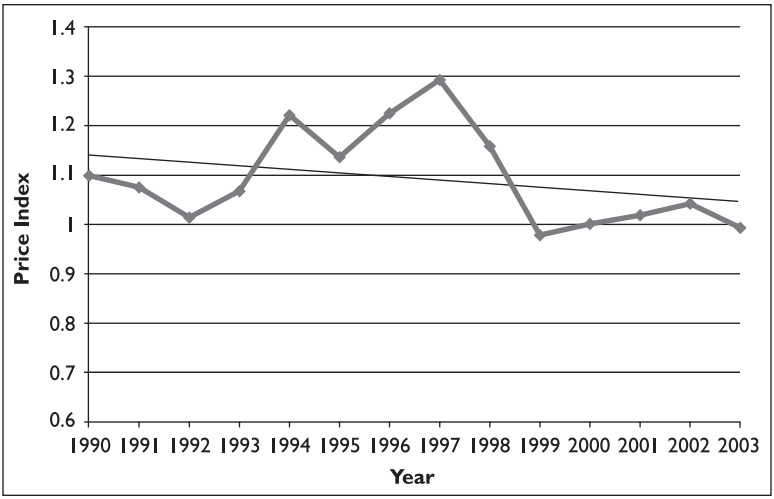

Figure 7. International Terms of Trade of All Food Commodities Vis-à-vis Manufactured Goods, 1990–2003

Source: UNCTADSTAT, UNCTAD, retrieved 21 May 2015, from http://unctadstat.unctad.org/EN/

international terms of trade for all food items vis-à-vis manufactured goods declined from 1.10 to 0.99, at an exponential annual rate of 0.7 per cent. The decline was much steeper during the later phase, when this index sharply deteriorated from a peak of 1.30 in 1997 to 0.99 in 2003, at an exponential annual rate of 3.4 per cent (Figure 7).

With the 'equilibrium' rate of profit maintained during a phase of declining per capita supply of food grains and deteriorating terms of trade, it essentially resulted in a continuous squeeze on the product incomes of the peasantry and the product wages of the working class in the agricultural sector.[3] After a certain point, it became difficult for peasants and agricultural workers to maintain their livelihood in this sector, since low levels of income jeopardized their living standards. Such a situation not only suppressed the purchasing power and compressed the demand of the working masses and peasants in the agricultural sector but eventually affected the production of these commodities. This made even simple reproduction in agriculture difficult, as Prabhat Patnaik (2008, p. 113) has noted:

> [w]hile it does compress demand immediately, it also has a long run effect on supply. As it undermines the viability of the peasantry, simple reproduction is no longer possible and supplies drop. The impossibility of simple

> reproduction of the peasant economy of course is the means through which the peasantry gets dispossessed of land and becomes destitute; it is precisely what capital wants and enforces. It represents nothing more than the march of capital.

The difficulty to maintain livelihoods in the agrarian sector is captured by an important statistical indicator, which is the high level of exodus of economically active people from this sector.[4] Figure 8 shows that there has been a decline in the share of the economically active population involved in agriculture-related activities to the total economically active population, especially in the developing world. In Asia and Africa, the share declined from approximately 62 per cent to 49.3 and 52.3 per cent, respectively, over the period 1990–2012.

The above statistics, however, cannot be sufficient to establish the claim as to the destitution of peasants and agricultural workers. It may be argued, on the contrary, that such an exodus of agricultural workers is due to development rather than distress. However, if one looks at some other indicators, then the nature of the distress becomes clearer. Over a period spanning 1995–2013, a total of 296,438 farmers have killed

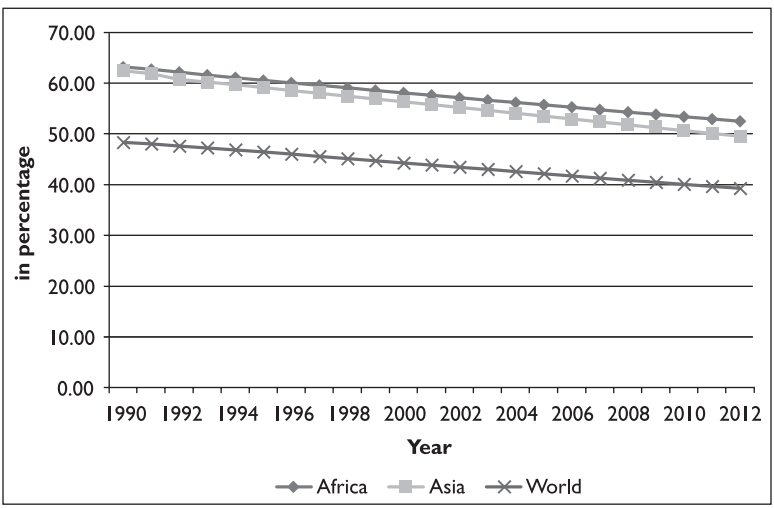

Figure 8. Share of the Economically Active Population in Agriculture to the Total Economically Active Population (by region)

Source: FAOSTAT, retrieved 21 May 2015, from http://faostat3.fao.org/download/O/OA/E

themselves in India, or an average of 16,469 suicides per year, due to distress-related factors (Posani, 2009; Sainath, 2014). Furthermore, most of the world's undernourished people are still to be found in southern Asia, closely followed by sub-Saharan Africa and eastern Asia, and mostly concentrated in the rural areas of these countries. The total number of people undernourished in Africa has grown from 177.6 million in 1990–1992 to 226.4 million in 2011–2013, and in sub-Saharan Africa these numbers have increased from 173.1 million to 222.7 million over the same period.[5] Although not holistic, these statistics are definitely some indication of the levels of distress suffered in these regions of the world.

At such a juncture, the rate of profit (in our model) fails to play the equilibrating role of maintaining the demand–supply balance in the agricultural sector, since driven by acute distress even simple reproduction becomes difficult. It accentuates the declining trend of agricultural production. To our surprise, one of the striking findings of this study is that the world economy over the period 1995–2004, in particular Asia and Africa, has been experiencing negative growth in per capita production of food grains, such as, cereals, coarse grains and pulses (Table 3). During 1995–2004, the per capita production of cereals in the world economy had been declining at an annual rate of 0.32 per cent, and, thereafter, over 2005–2012, recovered at a meagre rate of 0.85 per cent. A negative growth rate in fact signifies that there is a contraction in absolute terms in the per capita production of these food grains. This is quite a stark finding at a time when there are many fashionable discussions on the high growth rates experienced by developing economies across the globe. At present, the agricultural sectors of the world, in

Table 3. Growth Rate of Per Capita Production of Food Grains by Region

Food Grains	1995–2004			2005–12		
	Africa	Asia	World	Africa	Asia	World
Cereals	−0.18	−0.83	−0.32	0.27	1.50	0.85
Coarse Grains	−0.35	−0.79	0.16	0.03	3.10	1.02
Pulses	1.65	−0.83	−0.43	1.78	1.38	1.21

Source: Author's calculations based on data from FAO's database FAOSTAT, retrieved 21 May 2015, from http://faostat3.fao.org/browse/Q/*/E

particular those of developing countries, are significantly lagging behind other non-agricultural sectors of the economy. The agricultural sector is, in fact, experiencing contraction.

The international food market usually responds with a lag, since it is naturally difficult to bear immediately the fruits of sowing in agriculture and also because most countries maintain a minimum buffer stock to absorb the immediate shocks. As discussed earlier, the deflationary policies in the post 1980s especially squeezed the agricultural sector and neglected it in terms of support policies. Declining supply of food commodities at a rate that lagged even behind the population growth rate immensely impacted the international food market, which eventually affected the prices of these commodities. One might argue, from our analysis, that the ongoing high prices of agricultural commodities might lead to a revival of this sector and improve both production as well as supply conditions. If one looks carefully at the post-2005 growth rate of the per capita production of food grains in Table 3, such a conjecture cannot be entirely ruled out. It is evident that there are some improvements in the production and supply of food grains.

However, a note of caution needs to be added here. In recent times, the agrarian sector is increasingly being dominated by big business houses and multinational corporations due to these market-oriented policies (McMichael, 2009; Patnaik, 2014). The huge centralization of capital in the agro-food sector has been to such an extent that, in 2008, five corporations controlled 90 per cent of the international grain trade and the 30 largest food retailers controlled one-third of world grocery sales (McMichael, 2009; Moore, 2010a). Therefore, even if there is a gain in profitability through increased prices, there is nonetheless a decline in the level of income obtained by the producers of these agricultural commodities, due to the increasing hold of few giant corporations in the marketing of these commodities. This also has the additional effect, via a shift in income distribution from the lower-rung petty producers to the higher-rung marketing multinational corporations, of curtailing the consumption of the former, which might again affect the supply of these commodities (Patnaik, 2008, 2014).

In our opinion, the pursuit of demand deflationary neoliberal policies has been the most influential in explaining this episode of rising agricultural prices. However, no single factor can account, in totality, for this complex and prolonged phenomenon. There are some other additional factors, which have further accentuated the demand–supply imbalance in the agricultural sector. In the following section, we discuss the role of another such factor, namely, biofuels.

Impact of Increasing Production and Use of Biofuels

Neoliberal policies essentially lead, and have led in the past, to an opening up of the economic frontiers to finance capital so that it can freely flow in search of higher profits, particularly speculative profits, in financial markets across the globe. However, these speculative activities are not confined within the spectra of financial markets only. It had also spread to commodity markets, which has been a major force in driving up the prices of fossil fuels (Einloth, 2009). Higher prices of fossil fuels have led to an increased production of biofuels in search of alternative energy sources (HLPE, 2013).

As an alternative energy resource, the production of biofuels has increased immensely in recent times. Global biofuel production grew from 16 billion litres in 2000 to more than 100 billion litres (volumetric) in 2010, which accounted for merely 3 per cent of total road transport fuel (on an energy basis) (IEA, 2011, p. 13). The global production of ethanol, the most common type of biofuels, has increased from 13.1 billion gallons in 2007 to 23.0 billion gallons in 2010. More than 90 per cent of world ethanol production is concentrated in North, Central and South America. In the United States alone, the total production of ethanol reached approximately 13.23 billion gallons in 2010, which is almost seven times higher than even a decade earlier.[6] Although the growth in global production of biofuels has slowed from rates exceeding 30 per cent per annum in 2006–2008, the share of grain used for biofuels in relation to the total use of grains continues to climb (Trostle, Marti, Rosen & Westcott, 2011, p. 15). As of 2011, about 40 per cent of US corn was used in the production of ethanol (Wise, 2012).

There is, in fact, little controversy over the idea that production of biofuels had an impact on agricultural prices. Nonetheless, differences in opinion do exist over its magnitude.[7] A conservative estimate is that the increased demand for corn, soybean and wheat for the production of biofuels raised food prices by 10 per cent in 2006 (Coyle, 2007, p. 24). The Food and Agriculture Organization's (FAO) study also estimates that an increased use of biofuel feedstock (by 30 per cent) would account for an increase of sugar, maize and vegetable oil prices by as much as 26 per cent, 11 per cent and 6 per cent, respectively (FAO, 2008, p. 112). However, other studies have held biofuels production much more responsible for hiking food prices. Studies by the International Food Policy Research Institute (IFPRI) (Rosegrant, 2008) claim that it resulted

in a 30 per cent rise of food prices, while the study by IMF (2008) has estimated an impact between 25 and 45 per cent on corn prices. Mitchell's (2008, p. 16) study estimates that 70–75 per cent of the increase in the prices of food commodities was due to biofuels and the related consequences of low grain stocks and large land-use shifts.

To the best of our knowledge, in the literature, the precise nature of the link between biofuels production and the rise in food prices remains unsettled. In this study, we try to envisage two main factors that can cause an increase in agricultural prices. A necessary outcome of increased production of biofuels has been the shift in the cropping pattern and land use from food crops to feed crops, which severely affects the supply of crops used as food (UNCTAD, 2009). There is a shift in the cropping pattern to produce more profitable biofuel crops (World Bank, 2009, p. 73). In the European Union (EU) and other major wheat-exporting countries, the production of wheat was displaced by the production of oilseeds for biodiesel. The climatic and soil conditions required for the production of oilseeds are very similar to those required for wheat cultivation. Therefore, in most places, the cultivation of oilseeds displaced wheat, or was on land that could potentially grow wheat. In the eight major wheat-exporting countries or groups,[8] the cropped area growing oilseeds, such as, rapeseeds and sunflower, commonly used as feed for biofuel, increased by almost 36 per cent (84 million hectares) from 2001 to 2007. The potential for wheat production from this displaced land was almost 26 million tons in 2007, based on average wheat yields in each of these countries, and the cumulative wheat production potential of that land totalled 92 million tons from 2002 to 2007 (Mitchell, 2008, p. 11). The planting of other agricultural crops that compete for acreage with biofuel feeds, such as, maize or soybean in the United States, are also likely to decline over the years. For example, the planting of cotton in 2007 indicated a decline of almost 3 million acres (Westcott, 2007, p. 9). In six of the major biofuel-producing countries,[9] the total land cultivated to produce crops as feeds for biofuels amounted to about 47.8 million acres in 2006–2007, which is about 3–4 per cent of the total arable land in these countries (Trostle, 2008, p. 18).

At the same time, there is a growing demand for feeds to sustain the production of biofuels. One of the starkest examples is that of the United States, which is the largest producer and exporter of corn and which has diverted almost 15 per cent of global corn production from food to feed for ethanol, causing a global demand shock (Wise, 2012). In 2005–2010, the increased demand for ethanol absorbed almost 32 per cent of the growth in grain consumption (HLPE, 2013). It essentially means that for

every additional ton of grain (or by-product) used for food (direct and indirect), an additional 0.46 tons is used for fuel. In the case of ethanol from sugar, the growth in ethanol absorbed all of the increase in demand for raw sugar (HLPE, 2013). Likewise, the growth in demand for vegetable oil as feed for biodiesel during the period 2005–2012 absorbed almost 29 per cent of the cumulative growth in demand for vegetable oil; for every ton increase in vegetable oil for food and feed, biodiesel required an additional 0.41 tons of it (HLPE, 2013).

The increased use of food grains as feed for biofuel and the decreased supply of food crops due to diversification of land disturbed both the demand and supply balance in the international commodity market. Despite considerable evidence of the impact on price increases, biofuels have received huge state support in the developed countries, especially the United States and the EU, as well as in Brazil. However, these subsidies are extremely anti-poor in nature, since they are implicitly acting as tax on basic food. In 2006–2011, US ethanol expansion made the net corn-importing countries worldwide bear an additional cost of US$11.6 billion, with more than half of that cost, or US$6.6 billion, being borne by the developing countries. The vulnerable group of Net Food Importing Developing countries withstood an additional cost of US$2.1 billion (Wise, 2012). Some studies have warned that such added state incentives leading to an increase in the production of biofuels by developed countries might raise the international commodity prices to stratospheric levels (von Braun, 2007a, 2007b).

Hence, in our opinion, it is beyond doubt that the increased production of biofuels, using food as feed, contributed to an increase in the food prices. However, it is difficult to either develop a consensus or statistically compute its exact magnitude. The prediction of price increases varies widely and depends on the modelling approach used, with a range of 1–75 per cent (HLPE, 2013; Kretschmer, Bowyer & Buckwell, 2012). As mentioned earlier, speculative activities in energy markets are in a way responsible for encouraging production of biofuels. Do such activities also directly affect food prices? This is addressed in detail in the following section.

Speculation in Commodity Markets

To the best of our knowledge, the literature on the speculative activities in the commodity market and the driving up of food prices is not based on robust empirical evidence. The background to this speculation

debate is mainly trading in futures markets of agricultural commodities, which is a relatively new phenomenon. Therefore, one can merely guesstimate, or theoretically argue, that financial investors and speculators have contributed to rising prices of agricultural commodities, as the empirical establishment of it is no easy task and beyond the purview of this study. It is indeed true that it has been more than a century now that agrarian markets have been organized around forward contracts between the producer and buyer. However, since neoliberal reforms, the recent development has been the financialization of this sector where forward contract markets developed into futures contract markets, consisting of financial instruments, which can be traded as separate financial products on exchanges, such as, the Chicago Board of Trade Futures Exchange.

From early 2006, hedge funds, index funds and sovereign wealth funds got themselves involved in commodity markets. In the aftermath of the dot-com crash in 2000, the interests of a new class of financial investors in commodity futures trading attained new proportions.[10] Their main motive was to make speculative profits by diversifying their portfolios. Stoll and Whaley (2010), however, differ with the speculative nature of these investments. They argue that investments in commodity index markets are not speculative in nature, simply because these investments are long term, passive, fully collaterized and motivated by portfolio diversification benefits. Nonetheless, the authors also do not deny the fact that these investments are for mere financial motives—these being to make profits out of changing commodity prices (M-M+) and never having any intention of taking actual delivery or trading of these commodities (M-C-M+) (Moore, 2010b).

The developments in the US financial market during the financial crisis encouraged financial investors to diversify their assets towards commodity futures. As the US subprime mortgage crisis deepened since the late 2006 and spread in early 2008, financial investors started investing in commodity futures and options market, because the crisis made financial assets unattractive and denied the wealth holders a medium of holding their wealth (Gilbert, 2010). Financial deregulation, another sprout of this neoliberal process, gave a major boost to the entry of new financial players into commodity exchanges. Furthermore, the introduction of the Commodity Futures Modernization Act in 2000, 'effectively deregulated the commodity trading in the United States, by exempting over-the-counter (OTC) commodity trading (outside of regulated exchanges) from CFTC oversight' (Ghosh, 2010, p. 78). These allowed several unregulated commodity exchanges to operate in the United States. In the mid-1990s, 12 per cent of the largest wheat futures

market in the United States was held by financial speculators. By 2011, 61 per cent of that market was held by financial speculators and the remaining 39 per cent by commercial hedgers (Worthy, 2011, p. 13).

Trading volumes on commodity exchanges sharply increased in recent times. From 2003 to 2008, index fund investors have invested almost US$250 billion in US commodity markets, about half of it in energy (World Bank, 2009, p. 63). At the height of the boom in April 2008, an estimate by hedge fund manager Michael Masters showed that even on regulated exchanges in the United States, the investors owned approximately 35 per cent of all corn futures contracts, 42 per cent of all soybean contracts and 64 per cent of all wheat contracts (Ghosh, 2010, p. 78). Over the period 2006–2011, the total assets of financial speculators in the agricultural commodity markets have nearly doubled, from US$65 billion to US$126 billion (Worthy, 2011, p. 13). Such high volumes of trading and speculations in the futures market have an impact on agricultural prices.

Several arguments have been given in favour of the futures markets of agricultural commodities. These arguments are mainly based on the efficient market hypothesis (EMH), which basically means that prices in a freely operating market perfectly and instantaneously incorporate all relevant information available. It is also argued that there are essentially three advantages of speculative activities in the futures market of agricultural commodities, which would benefit the farmers. First, speculative actions are perceived to discover and obtain better prices for farmers. Second, they are assumed to decrease the price volatility, since the speculators are assumed to buy when prices are low and sell when prices are high. Third, these speculative actions offer participants hedging and other tools for price risk management and thus help them to carry on with their real work without worrying about the possible change in prices (Headey & Fan, 2010, p. 41; Irwin & Sanders, 2011).

However, there are several criticisms of these aforementioned benefits. Regarding the first argument, it is only possible in reality if the causality runs from futures to spot markets—the discovery of future spot prices help farmers make better cropping decisions and increase spot prices at harvest. Then, futures trading can increase prices actually received by farmers, who themselves do not trade in futures, only if the causality runs from future to spot prices (GoI, 2008). In other words, there is a logical contradiction to claim that futures trading will generally tend to improve prices received by farmers and yet maintain that futures trading can never contribute to inflation of spot prices. This point, in fact,

substantiates that such trading activities have affected the spot prices in international agricultural market.

With respect to the ability of futures markets to reduce spot price volatility, the uninformed trading of financial speculators combined with herd behaviour related to those managed funds, in reality, tends to make prices more volatile (Worthy, 2011, p. 24). The recent experience of the problems faced by the world's richest farmers and traders in the United States to avail risk management from the largest futures trading market put in scrutiny the third benefit.[11] The problems faced in the United States regarding these futures trades are: (i) the entry of new speculators with very little commodity domain knowledge; (ii) unusually high basis risk and convergence problems associated with the recent futures contracts; and (iii) the inability of the producers or the traders of these commodities to get adequate credit for margin requirements (GoI, 2008; UNCTAD, 2009).

In this study, while there is little doubt that speculation has played a role in the recent rise of agricultural prices, it cannot be a stand-alone explanation of this inflationary crisis. This explanation also loses its thrust until and unless real market factors are taken into full consideration. Though speculators invested in the commodity markets to gain from price changes, they will always prefer financial assets over agricultural commodities, since the latter has higher carrying costs and greater risks associated (Patnaik, 2008). Speculators will not move to commodities unless they already have inflationary expectations and some indications of tightness in the agricultural market. Therefore, in our view, speculators can act only on top of a basic situation of shortage, which is why the speculation argument can only point to a compounding factor, not to the basic explanation for the inflationary situation. Hence, amidst these other factors, speculation plays a catalytic role; it cannot be the lone explanation to this inflationary situation.

Concluding Remarks: Is This Price Upsurge a Permanent One?

The increase in agricultural prices, and its continuation to date, has raised a lot of questions on whether this episode of price rise is a permanent one or another episode of price volatility. Some economists and policymakers prefer the former, because they presume that there is not much scope to improve supply in the agrarian market due to the non-availability of

natural resources. A logical extension of it is that the agrarian sector has reached its supply limits due to constraints on natural resources, which will hinder the future expansion of commodities and put it in a severe crisis. This viewpoint echoes the belief of classical economists, such as, Ricardo and Malthus, that the diminishing returns in agricultural commodity production due to constraints on natural resources and the overgrowing population would be responsible for increase in real prices of agricultural commodities (Chand, 2008, p. 122).

To assess whether this recent price hike is a temporary or a permanent phenomenon, it is important to identify the underlying factors behind this crisis, which this study has attempted to do. The argument that the world has reached its limit in terms of natural resources is neither theoretically nor empirically substantiated. Studies forecast that despite limited quantities, there is little likelihood that the world will run out of natural resources in coming decades (World Bank, 2009, p. 74). In fact, the existence of ample (and growing) reserves, and a history of significant improvements in technology with which resources are found and extracted, suggests that there is no immediate possibility in the near future of running out of resources. The world is not yet faced with Malthusian constraints (Wise, 2013).

This study finds that the essential factor causing an increase in agricultural prices is that of the rate of growth of supply lagging behind that of demand in the international commodity market. However, this is not a consequence of any constraints on natural resources. Rather, it is the fallout of demand deflationary neoliberal policies that have squeezed the incomes of the peasantry and agricultural workers, especially in developing countries, to such an extent that even simple reproduction in this sector had been difficult—the peasants preferred to keep their lands fallow instead of cultivating them. This led to a decline in the supply of agricultural commodities, especially causing a negative growth of food grains in per capita terms, triggering a supply–demand imbalance in the international market, which eventually caused an upsurge in the prices of these commodities. In addition, diverting food crops to biofuels and using up arable land for the production of more grains as feeds further distorted the demand–supply balance of the international agrarian market. Speculative activities in the futures commodity market acted as a catalyst on top of this and supplemented these tendencies of rising prices and later sustaining them at higher levels.

Nonetheless, in essence, all these factors have one common thread—neoliberal policies. Thus, the present crisis, contrary to what others believe, is not a result of any constraints on natural resources but is

primarily an outcome of neoliberal policies. A reversal of these policies will lead to a revival of agricultural activities. Thus, the immediate task is to insulate the peasantry by protecting them via measures, such as, income support, subsidies, agricultural investments and welfare enhancements. However, this would essentially mean that these economies then have to abandon the market-oriented neoliberal policies and adopt a *dirigiste* regime protective of peasants and petty producers. The realization of these alternative policies, or the extent to which they will be implemented, essentially depends on the political scenario.

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Notes

1. See FAOSTAT, http://faostat3.fao.org/browse/I/*/E, accessed on 23 May 2015.
2. The World Bank also supports the argument that world food supply conforms to world food demand in the long run.
3. We assume here that there is a class of agricultural workers, whose wages can be adjusted to maintain the rate of profit, that is, they act as price takers in the economy.
4. One of the limitations of this study is that it failed to find long-run statistics of agricultural income in the developing countries. In recent times, it has become more difficult to find these statistics, since many countries have reduced their resources devoted to collection of agricultural and rural statistics (World Bank, FAO and United Nations, 2011).
5. See FAO, Food Security Indicators, http://faostat3.fao.org/browse/D/*/E, accessed on 21 May 2015.
6. All statistics here are drawn from the Renewable Fuels Association, http://ethanolrfa.org/pages/statistics, accessed on 7 September 2012.
7. For a detailed summary of the effect of major biofuel policies on commodity prices, see Appendix A1 of HLPE (2013).
8. These eight major wheat-exporting countries or groups (the United States, Canada, European Union, Russian Federation, Australia, Argentina, Kazakhstan and Ukraine) accounted for 90 per cent of total wheat exports in 2005–2007.
9. These six countries or groups (Argentina, Brazil, Canada, China, European Union and the United States) accounted for 95 per cent of total world production of biofuels in 2006–2007.

10. These investors regard commodity futures as an asset class similar to equities, bonds, real estate and emerging market assets and take positions on commodities as a group based on the risk–return properties of portfolios containing commodity futures relative to those confined to traditional asset classes.
11. The problems experienced by US farmers due to commodity futures markets were discussed at the Agricultural Forum held by the US Commodities Futures Trading Commission (CFTC) on 22 April 2008; see http://www.cftc.gov/PressRoom/PressReleases/pr5489-08, accessed on 23 May 2015.

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