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THE WORLD AFTER GLOBAL FOOD CRISIS OF 2006-08: BIO FUEL, FOOD FEED COMPETITION, COMMODITIES MARKET AND DEMAND SUPPLY MISMATCH

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ABSTRACT

Food security is one of the key characteristics for an economy to develop. The global food crisis of 2006-08 has created the threat to this food security globally. This paper we will be looking at the reasons lead to such huge crisis and will try to critically evaluate each cause to find out the major cause among them and causes which made it a great matter of concern. Thought to be a crisis caused by food feed competition through critical reviews shows is a combined effort of increasing demand for bio fuels and establishment of commodities market. Evidences cited in the paper would make it clear that the appetite of people around the world has not increased and neither is there a drastic fall in supply of grains but the growing demand of capitalists and big firms for fuel production combined with commoditization of agricultural products had led to the much talked about food crisis.

KEYWORDS: *Food Security, Economy, Global Food Crisis, Hunger And Malnutrition, Market Economy*

INTRODUCTION

"A food crisis occurs when rates of hunger and malnutrition rise sharply at local, national, or global levels.

This definition distinguishes a food crisis from chronic hunger, although food crises are far more likely among populations already suffering from prolonged hunger and malnutrition. A food crisis is usually set off by a shock to either supply or demand for food and often involves a sudden spike in food prices." (Timmer,2010)

General notion regarding food crisis is that it occurs due to some demand or supply shock related to consumption or production but was the 2006-08 crisis cause because of these reasons is a question to be asked. World food prices have increased significantly in past few years specifically in 2006-08 which was regarded as a period of massive crisis and led to food riots in many parts of the world. When prices declined in second half of 2008, international attention wavered but this price shock was not a onetime shock as prices again soured at high levels in 2011-12 which is regarded as twin crisis and this may help us in suspecting that this rise in prices is a systemic phenomenon and may not go back to earlier levels again. For example Mexico which was earlier a pioneer in domestication of corn. Before global food crisis Mexico was surplus producer of corn and now shifted to net importer of corn. Such was the affect of Global food crisis in many parts of the world. (Vivas, 2009)

The most important indicator of a food crisis in a market economy is an abnormal and persistent increase in prices in real terms (Chand,2008). Different authors have different views relating to factors which led to the global food crisis and those can be clubbed into mainly three types i.e. demand side factors, supply side factors and commoditization of agricultural products . (Ploeg,2010), (Chand,2008) , (Banerjee,2011) (Patnaik,2009). All these factors would be discussed in much detail in subsequent sections.

FACTORS CAUSING GLOBAL FOOD CRISIS

A. SUPPLY SIDE FACTORS

1.Short term food output decline:-

Many authors argue that in recent past there is a crisis of output which has led to shortage of food in world market which in turn has led to food crisis. The drought-led Australian wheat disaster and the exceptional fall in wheat production in Ukraine in 2006-07 due to the excessively hot climate in Europe are justified as evidences behind the soaring prices. Other major wheat exporting nations like Argentina also faced a decline in production. We can see in table 1 after 2004 there was decline in absolute tonnes of production but no crisis occurred at that time but we can say output did go stagnant at this time.

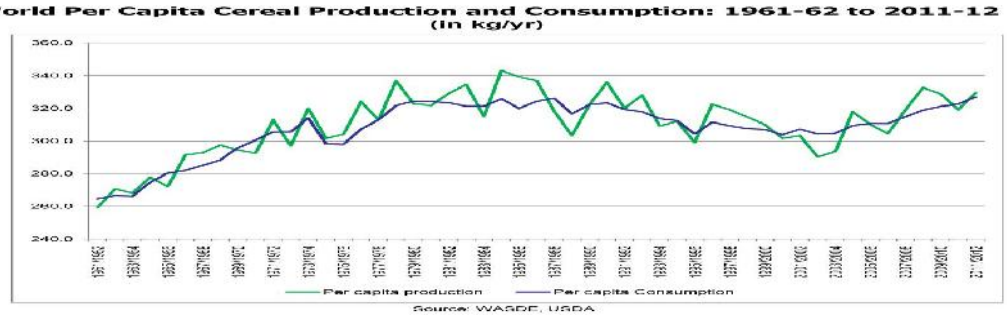
Table1: World Cereal Output in million tons since 2000-01

Years	Production
2002-03	1821
2003-04	1864
2004-05	2043
2005-06	2017
2006-07	2005
2007-08	2125
2008-09	2241
2009-10	2241
2010-11	2200
2011-12	2297

Source: World Agricultural Supply and Demand Estimates (WASDE), USDA

The supply-constraint argument runs into a major empirical and theoretical problem. While it is true that the world cereal production declined by 3.6 percent and 6.9 percent in 2005 and 2006 driving down the global stocks to a new low, the food prices continued to remain high even after the cereal output recovered in 2007. The decline in world grain production in 2010 was even more negligible at 1.8 percent. These occasional declines are too minute to explain the secular and sizable increases in food prices.

Citing decline in output as the reason would not be justified if we see Figure 1 into account which shows world per capita cereal consumption and production. This helps us in knowing that after 1980 till 2003 per capita consumption and production were continuously declining and they actually picked up after 2003 and reached highest levels it achieved in 80's. So according to Patnaik (2008) there should have emerged a massive food shortage during this period given the fact that average per capita incomes across the world has increased in this period but due to deflationary policies as a part of structural programmes of developing economies consumption also declined with production as is evident from the graph. So we can clearly say output decline and cannot be held as the reason for global food prices. But at the same time looking at case of India as the food availability is almost at the same level there is no rise in consumption levels from past 30 years which have been on a decline. This can be attributed to the unequal income distribution as even though as said by George W Bush per capita income is rising but that rise in income is coming only from a particular set of population and major population is still undernourished and therefore overall consumption has been on a decline and because of this inequality many developing countries have been avoiding food crisis from many years. It is likely that the worsening income distribution in both countries may have has something to do with it, so that increased demand from high income groups is counterbalanced by reduced demand from poorer sections, but obviously this needs to be explored further. (Patnaik,2008)



2.Declining exports:-

During the period of global food crisis there was a common notion among all countries to decrease their exports and there was simultaneous policies of export restriction. Overall grains exports do not show any declining trend during this period. Between 2004/5 and 2011/2, the per capita world grain exports increased from 37.4 kgs to 49.3 kgs each year in the period except 2010/1 registering an increase (USDA PSD database) (Banerjee,2009). The restrictions reduced supply on international markets, helping to drive prices even higher.

High input prices: One possible supply-side pressure on the cereal prices can be due to the soaring oil prices in recent times. Oil prices can have impact on food prices through use of intermediate inputs Like fertilizer, chemicals, fuel, lubricants and electricity that are supplied to agriculture by the industry. However, as Chand (2008) points out, the transmission coefficient of crude oil prices on cereals is only around 0.18 and only a small part of the food price increases can be explained through this argument. As when crude oil prices increase by 150% the food prices also increase by around 100-150% so this coefficient can be missing some indirect link between crude oil price and food price which would be discussed in later sections. (Banerjee,2011)

All the facts illustrated above force us to look beyond supply factors towards demand factors to determine reasons behind global food crisis

B. DEMAND SIDE FACTORS

1. Rise of middle class in India and China:-

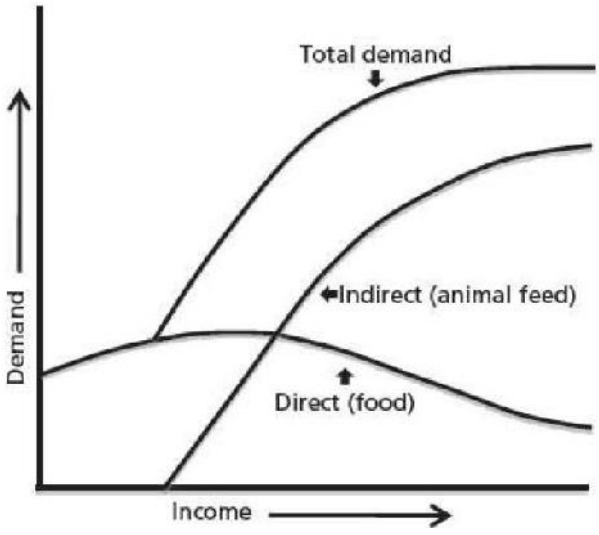
This argument was initially formed by Paul Krugman and George W. Bush and later by rest of developed world that as middle class of any country expands the country starts consuming more and more of animal products and more packaged and processed food. They held that as India and China are expanding the countries will have more diversified diet as per capita income of these two countries will be expanding. At increasing per capita levels there will be an increasing amount of grain being consumed as animal products and give rise to **food feed competition**.

"Adam Smith remarked in his *Wealth of Nations* that there was a natural upper bound to the demand for food, since how much a person could eat was limited by the size of his stomach. He could not have foreseen the sharply increasing animal-products intensity of diets as populations grew better off."

- Utsa Patnaik

In one of the articles by Youtopolous(1985) he explained as income rises, the middle income classes consume more meat and dairy products leading to a much higher demand for grains given the poor conversion ratios between grains and animal products.

Figure-2 demand for cereals, total, direct and indirect, according to incomes



Here he illustrated that as income of an economy keeps on rising direct demand for food first rises which means demand for grains, cereals, wheat and other consuming commodities. As with time as income keeps on rising further consumption of packaged and processed food which includes consumption of milk, chicken, meat etc starts increasing further. This leads to decrease in direct demand but increase in indirect form in form of grain which has to be fed to animals for consumption of meat and chicken. According to analysis of Youtopolous (1885) the relevant calorie-equivalent grain meat conversion ratios vary from 2:1 for poultry to 7:1 for grain fed beef which means for consumption of 2 kg of beef the cattle has to be fed with 14 kg of grains which means indirectly a person in one diet is consuming 14 kg grains.

The data for grain utilization in India or China does not really support this hypothesis. Table 2 shows total food availability and per capita food availability in India. Food availability here is calculated by adding production and net imports and deducting net addition to stocks, this food availability takes into account both direct and indirect demand for food. This increasing consumption theory is proved wrong in Indian context according to both total food availability and per capita food availability as total food availability declined in the period 2002 to 2005 from 189.5 to 170 and in later periods at maximum reached 189.1 in till 2010 so there was not much change in consumption as well as food availability pattern during this period.

Table 2: Food availability in India: 1991 to 2010

Years	Total Food Availability (million tons)	Per capita Food Availability (kg)
1991	158.6	186.2
1996	163.4	173.5
2002	189.5	180.4
2003	170.6	159.7
2004	183.3	168.8
2005	170.0	154.2
2006	182.1	162.6
2007	183.7	161.6
2008	183.5	159.1
2009	189.5	162.0
2010	189.1	159.5

Note: Food includes both cereals and pulses as the latter is an important food item in India
Source, Economic Survey, Ministry of Finance, India

This table helps us in developing intuition that demand for grain might increase because of increase in income of middle class but that increase in demand does not compensate for fall in large masses of poor people in rural areas. In the longer run, the total availability of food has increased when we compare the current decade with the nineties. Overall we can conclude rather than increase in consumption the demand for food grains in India is declining which has already been explain in above part of the paper.

The situation in China is much better than that of India as we move our focus towards Table 3 which indicates that the total cereal availability has increased in China by around 60 million tons between 2004 and 2010. There is also a rise in the per capita grain consumption in China by 35.6 kg during these years. But increase in consumption of China is very less as compared to US economy. The US per capita cereal increased by 148.5 kg in this period, more than 4 times than that in China.

Table 3: Food Availability in China and USA, 2004-05 to 2008-09

Years	Major Cereals (mmt)	Per capita Cereal Use (kg)
CHINA		
2004-05	373.4	280.7
2005-06	376.6	281.6
2006-07	382.8	284.7
2007-08	391.4	289.5
2008-09	399.7	294.1
2009-10	414.6	303.6
2010-11	433.9	316.3
USA		
2004-05	276.1	930.2
2005-06	279.7	932.9
2006-07	277.9	917.6
2007-08	307.2	1003.9
2008-09	314.2	1016.0
2009-10	330.4	1057.2
2010-11	340.7	1078.7

Source: World Agricultural Supply and Demand Estimates (WASDE), USDA

Such high level of per capita consumption does not mean that a person in USA eats 4 times as compared to a person in China. Explanation of this can be done with the help of direct and indirect consumption as we have discussed above. Going through the facts and evidences we realize the process of food feed theory and rise in consumption is a long term change and requires many years to put into effect and also in past USA reached their peak of consuming meat and there was no further scope of increasing grain demand but still grain demand increase from 930 kg to 1078. The bulk of this increase in the US has occurred due to the diversion of large amounts of corn production to its ethanol industry .This increase can better be explained with the help of second demand side factor i.e. rise in demand for bio-fuels.

2. Rise in demand for bio fuels:-

One of the major reasons which led to abnormal rise in food prices was increasing conversion of grains for noon food use i.e. for commercial use in the form of bio fuels. To understand this working we can take help for article by Banerjee (2011) who studied the corn-based ethanol production in the US since 1980and tried to extend the food feed competition to food feed fuel competition. According to a survey US produces around 50% share of World Fuel Ethanol Production.

Food feed fuel competition:-

The arguments begins with the food feed competition as discussed by Youtopolous (1885) which has already been discussed which was that in long run the following story unfolds

Rise in Income levels → Increase in meat demand → Rise in meat prices →

Increase in livestock production → Soft grains diverted as animal feed →

Rise in food prices

This rise in food prices affected the poor classes the most but Yotopolous himself mentioned that this long run story in counter balanced by short run adjustment by livestock which absorbed the price shock in the following manner:

Supply Shortfall of grains → Increase in grain prices → Pushes meat prices up →

Reduction in meat consumption → Cutback in Livestock production →

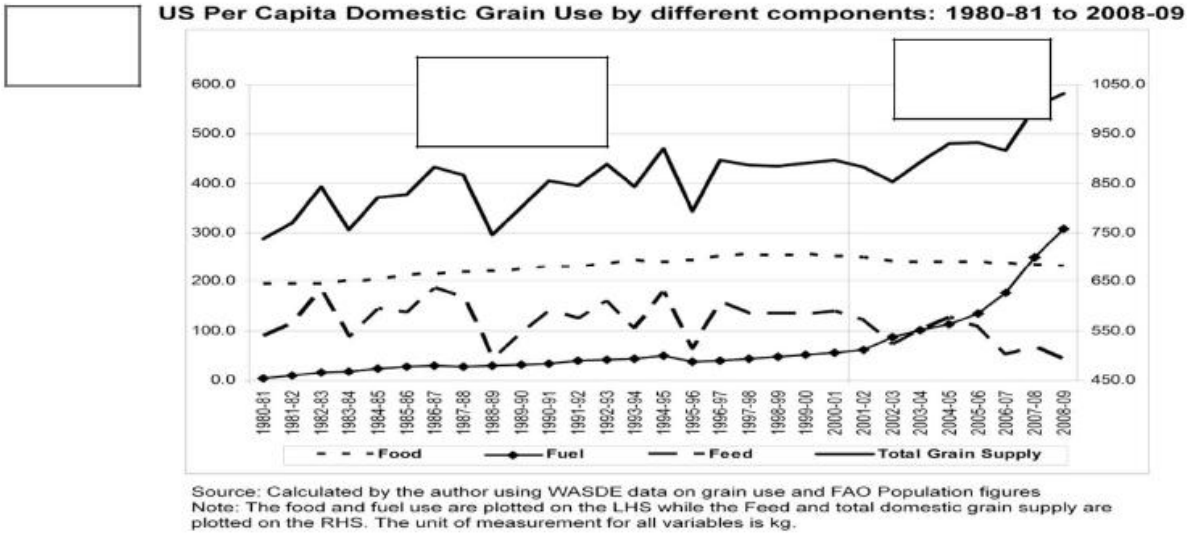
Releases grains for direct consumption

This release of grain for direct consumption benefit the poor the most as their diet mostly consists of grain and more grain is available for their consumption and through this adjustment price shock is absorbed.

Bio fuels have been on a rise due to environmental concerns regarding fossil fuels depeletion and finding different alternatives through which fuels can be produced. bio-fuels have emerged as the favoured substitute for fossils fuels like petroleum and diesel. However, the viability of this transformation remains under question, particularly when one assesses the food-energy competition that has intensified with this change. A bio-fuel like ethanol, which is chemically a hydro-carbon, can be produced from any crop that contains sugar. Ethanol was majorly produced in US using corn(50%) and in Brazil(38%) using sugar cane.

This sudden rise in output of ethanol is held as one of the major reasons for abnormal rise in prices of grains as grains are used for non food consumption i.e. for producing fuels. The short term adjustment that used to happen in food feed market as regarded by Youtopolous has stopped after 2000's. We can look into the diagram:

Figure 4



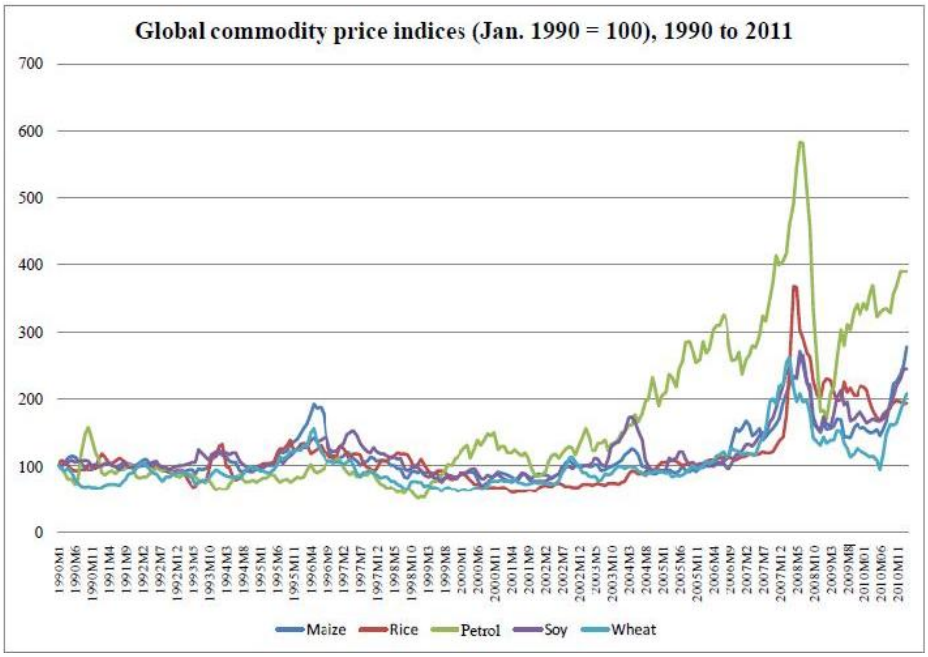
Source: Calculated by the author using WASDE data on grain use and FAO Population figures
Note: The food and fuel use are plotted on the LHS while the Feed and total domestic grain supply are plotted on the RHS. The unit of measurement for all variables is kg.

Here we can see all price adjustments till 2000's used to be done by food feed competition but due to the entry of fuel from early 2000 the adjustment stopped and as can be very well seen total grain supply is going on a rise due to more and more demand of fuel.

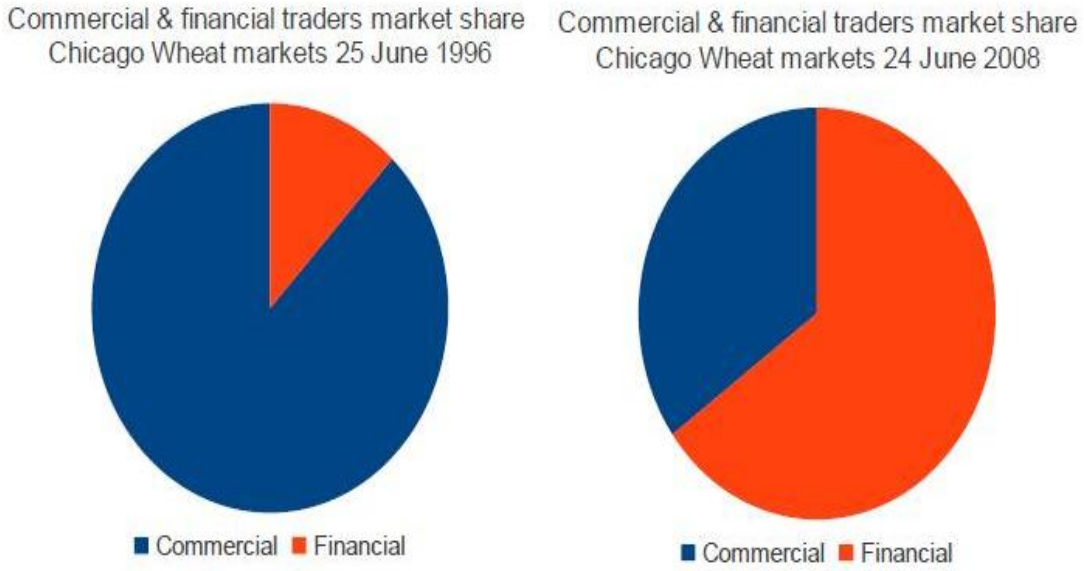
So we can safely say due to rise in price of crude oils there has been a drastic increase in demand for ethanol which in turn has led to increase in price of grains as corn prices have started chasing the ethanol prices. So the adjustments and cutting backs that used to happen in food feed competition has disappeared due to the food feed fuel competition as no substitute of fuel required by cars is available. The substitute present i.e. crude oil already have a high price and cars cannot be fed with grains instead of fuel. Earlier food feed competition was internal to human diet but now it is external as it takes the diet of car also into account.)(Ploeg,2010)(Banerjee, 2009) (Banerjee,2011)(Chand,2008)

C. DEVELOPMENT OF COMMODITY FUTURES MARKET FOR AGRICULTURE

Commodity futures market was developed as a mechanism for hedging risk but as held by Chand(2008), Ghosh(2010),Ploeg(2010) commodities market was held as one of the major reasons behind abnormal rise in prices of food products.



In commodities market price of a food grain is fixed 1 year down and farmer invests for preventing himself against downward fluctuation and prices are determined in advance. Commodities market also work like the financial markets and there is no need to store products in warehouses. Ghosh(2010) and Ghosh and chandrashekhar(2012) argued During the phase of global food crisis money the finance was shifting from stagnating housing markets to agricultural commodities by bankers, stake holders and other big players rather than the farmers and the moment non farmers entered commodities market speculation was also brought into fray to create artificial bubbles. Speculation led to artificial shortage and lead to high rise in prices. This entry of non farming players in commodities market led to rise in prices of many food commodities.



Source: Better Markets submission to Commodity Futures Trading Commission (CFTC) on position limits.

Farmers used commodities future market for agricultural purpose but non farmers used it for speculative purpose and large financial investment that came in at time of food crisis can be held as one of the major reasons behind the global food crisis.

CONCLUSION

Coming back to our original question that food crisis is a manifestation of food supplies not able to keep pace with the demand we can clearly see from the evidences cited in the paper the appetite of people around the world has not increased and neither is there a drastic fall in supply of grains but the growing demand of capitalists and big firms for fuel production combined with commoditization of agricultural products had led to the much talked about food crisis. There has been increase in grain production but as noted by Chand(2008) this grain is not available for food or feed purpose but rather used for production of bio fuels and has resulted in shortage of grains for consumption purpose.

As noted by Ploeg(2010) 'The current agrarian crisis emerges out of the interaction of: (1) a partial but constantly ongoing industrialization of agriculture; (2) the emergence of the world market as the ordering principle for agricultural production and marketing; and (3) the restructuring of processing industries, large trading companies and supermarket chains into 'food empires' that increasingly exert a monopolistic power over the entire food supply chain' So commercialization of agriculture has resulted in a big concern for the world and food feed combined with the fuel demand has resulted in shortage of supples.

To minimize the social and economic impacts of international food price volatility on the poor and other vulnerable groups, food needs to be available where it is needed most. Poor countries need to focus on producing their own food and not become overly dependent on international markets. Also restriction of non farming players in commodities market is required.

Blaming US for the food crisis alone is not at all correct as if we see trends of past few years almost all developing countries have not increased their food grain production by a large extent as they are making structural adjustments in agriculture as agriculture isn't consider a sector through which a country would grow and due to this stagnated agricultural growth production levels remain low. Comparing this with US economy there has been unprecedented increase in production of grains in the past few years and that increase is largely because of corn yield. US produces corn for bio-fuels domestically and also an exporter of corn so it is also able to sell corn at high prices. So investment by developing countries is dire need of the hour.

Solutions suggested by Chand(2008) were shift towards a vegetarian diet and reduced intake of meat products, organic farming which could also reduce the impact of rising prices of fertiliser on food prices and usage of genetically modified food crops, which can give higher output per unit of input.

Besides increasing development assistance for agriculture, developed countries can also take a number of steps that could help to improve food security in poor countries. These include curtailing—not subsidizing and encouraging—biofuel policies that distort the global food supply as well as undermine environmental sustainability.

As this crisis is driven by capitalists producing fuel to run cars of elites and side by side we can witness food riots and mass hunger so as said by Banerjee(2012) 'current capitalism phase has two choices; either the ruling elites end up eating the environment or choose to eat up the few morsels left on the plates of those who produce the surplus and wealth for them'

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