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Soaring food prices and food security in LIFDCs The case of Nepal

1 - INTRODUCTION

The steep and continued rise in the prices of agricultural commodities traded internationally, beginning towards the end of 2006, has been the object of numerous studies, as regards causes and consequences several of which concerning Asian cases (Imar, Gaiha, Thapa, 2008; Trostle, 2008a; Kulkarni, Imar, Gaiha, 2009).

The FAO Food Price Index increased between April 2007 and April 2008 by 54 percentage points, driven by a 92% increase in cereal prices and a 98% rise in those of oils and fats. After reaching a peak of 214 (2002-2004 = 100) in June 2008 there was a gradual decline until February 2009 but thereafter the index continued to rise, driven in this period principally by cereals and sugar, reaching 152 in May and, after slight oscillation, remaining at that level in August, the latest figure at present available. Current forecasts are for a continued increase in cereals prices in the 2009 season (FAO, 2009a).

As could be foreseen, the increase in the prices of agricultural commodities has particularly hit the vulnerable populations of those countries which spend a substantial share of their income on food, undermining their food security and eroding their already limited purchase power (Von Braun, 2008). Particularly during the year 2008, the food import bill of the Low Income Food Deficit Countries (LIFDCs)¹ showed a significant increase, due particularly to the import of cereals and vegetable oils (FAO, 2008a).

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¹ According to the definition of Food and Agriculture Organization of the United Nations (FAO), Low Income Food Deficit Countries (LIFDCs) are those countries which are net importers of food (defined on a calorie basis) and are characterized by having a per capita Gross National Product (GNP) below USD 1 465.

The aim of this paper is to analyse the current situation of food security in a specific LIFDCs, Nepal, one of the poorest countries in South-east Asia, at high risk as regards levels of food security, in order to give a concrete illustration of how the current rise in food prices affects households in this type of environment, interacting in an already precarious situation. Whilst the study is limited specifically to the case of Nepal, much of the analysis could similarly be applied to other low income food deficit countries. The Nepalese case, however, represents an extreme situation in which all of the factors contributing to food insecurity were present before the onset of rapidly increasing prices for food commodities.

A brief introduction to the overall situation in the country is presented in Section 2, followed by an analysis of the price movements in major food items internal to Nepal, during the period which coincided with the strong upward trend in international prices in 2008. In Section 3, the underlying, long term causes of food insecurity in Nepal are described. The consequences of the price increases on the Nepalese population and the coping strategies adopted to deal with them are examined in Section 4. Finally, in Section 5 some suggestions are put forward about possible methods for improving food security in the country and rendering the situation less vulnerable to price shocks on external markets.

2 - FOOD SECURITY IN NEPAL: THE IMPACT OF RISING PRICES

2.1 - *The overall situation*

Nepal is amongst those countries in Asia which are most susceptible to damage from rises in food prices: about 40 percent of the population in the country is chronically food insecure, 48% of children under the age of 5 are underweight and 39 percent of these are severely malnourished (Rai *et al.*, 2002; Unicef, 2009). Clearly, further increases in the prices of agricultural commodities will have devastating effects on household food security status for these vulnerable fractions of the population and will increase the percentage of the population falling into this category.

Agriculture in Nepal is still the backbone of the economy, representing approximately 34 percent of the Gross Domestic Product (GDP) in 2006, but the country nevertheless relies to a large extent on the import of food, especially cereals, in order to meet its requirements. In 2006, the

imports of goods and services were equivalent to 32 percent of the GDP while exports amounted to only 14 percent (World Bank, 2008).

As noted by Sarris (2000), countries with excessive food import bills are highly susceptible to price rises, even when instability in world cereal markets is less acute. In fact, as will be seen, in Nepal local prices do not move strictly in line with international prices, but are strongly influenced by other local factors, in particular, transport costs and specific local supply-demand characteristics (Larson, 1999).

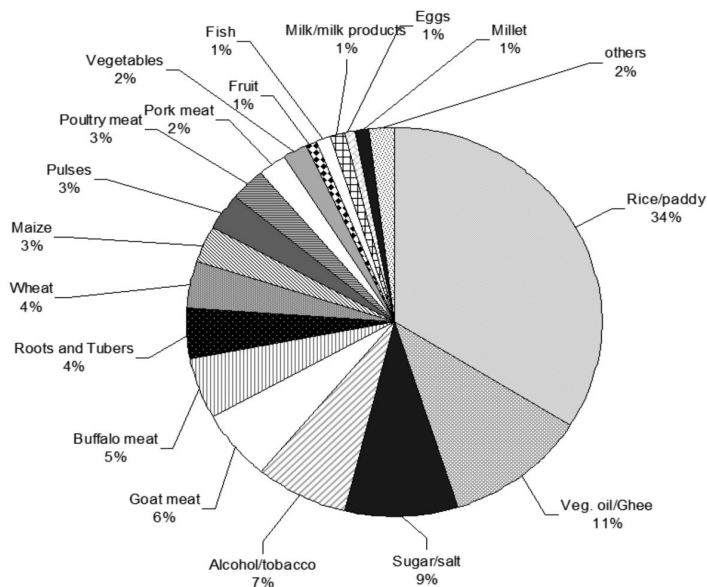
In the specific case of Nepal, but also in other countries with inadequate infrastructures, food security is highly influenced by the country's geographical features. The nation is divided into three agroecological zones, namely *Terai* (the lowlands), the hills and the mountains. *Terai* is the main food producing area of the country since the advantageous topographic and climatic features allow agriculture to flourish; it occupies only about 17 percent of the national land area however. As altitude rises, agricultural production tends to decrease due to less favourable climatic conditions, shorter growing periods and increasing soil gradients which make cultivation difficult. In mountain areas transport is also complicated due to the lack of adequate infrastructure. As a result, in Nepal the higher the altitude, the more at risk is the food security status of the household.

Another important feature characterizing Nepal's food supply situation is the lack of modern technology: crop production for the most part is almost exclusively dependent on rainfall, and hence affected also by the global fluctuations in temperatures and precipitation patterns which have increased in the last decade (Sivakumar and Hansen, 2007).

The monthly food expenditure for Nepal gives a good idea of the possible effects that soaring food prices have on the food security status of vulnerable families: on average in Nepal, a household spends 59 percent of total expenditures on food while the poorest 20 percent spend up to 73 percent (WFP/NDRI, 2008).

The data describing the monthly food expenditures, shown in Figure 1, give an indication of the role that different food items play in Nepal in terms of food security.

Rice is by far the main source of expenditure (34% of total monthly food expenditures), reflecting the dietary habits of the Nepalese population. As far as cereals as a group are concerned, maize, wheat, millet and rice together constitute 42 percent of the monthly food expenses. Meat products follow as a major source of food expenditure, with a value of 17 percent; vegetable oils constitute 11 percent of costs associated with food purchase while the figure for salt and sugar is 9

FIG. 1 - *Composition of monthly food expenditures in Nepal*

Source: compiled from WPF (2006).

percent. Other expenses – the acquisition of vegetables, fruits, milk products, pulses and tubers are minor. Thus the greater part of household expenditure is directed to those products which have registered spectacular price increases on world markets.

In the following paragraphs the situations in these market sectors in Nepal, in concomitance with the sharp rises in international prices, will be examined in more detail. Common to the situations in all markets, however, is the influence of fuel prices on the price increases registered, and this factor will be briefly examined first.

2.2 - *Fuels*

Fuel prices in Nepal play a very important role in food security and are directly interlinked with the increase in prices of agricultural goods, especially in the hill and mountain areas, in part through their direct impact on running costs of agricultural machinery, but, more particularly, they are crucial for the transport of food in order to meet the demand of the numerous food deficit districts.

Fuels, in fact, are more important for transport of food items than for the utilisation of agricultural machinery since mechanization of the agricultural sector is limited. In contrast, the utilisation of fuel for moving agricultural products from one district to the other and from one agroecological area to the other (usually from *Tera*i to hills and mountains) is fundamental.

Although the energy sector in Nepal is highly subsidized by the Government, the international rise in prices of petrol products has forced an increase in the cost of fuels. As shown in Table 1, starting from the 10th of June 2008, fuel prices have changed substantially with the exception only of gas. Gasoline and diesel prices increased by 25 and 24.4 percent respectively whilst those of kerosene, a commonly utilised cooking fuel, rose by 27 percent.

TABLE 1 - Price (in NPRs) changes of selected petrol products in Nepal, 2008

FUEL TYPE	UNIT	PRICE	% CHANGE	
		Before 10 th June '08	After 10 th June '08	
Gasoline	Litre	80	100	25.0
Diesel	Litre	56.25	70	24.4
Kerosene	Litre	51.2	65	27.0
Gas	Cylinder	1,100	1,200	9.1

Source: compiled from WFP/MOAC/FNCCI/CIPF (2008a).

2.3 - The Cereals Sector

In this sector, which accounts for 42% of domestic food expenditure, and a higher proportion of food consumption on account of household self-supply, production of the 3 main crops increased in 2007-08 season, as compared with the previous year.

Nonetheless, the situation of the country's food availability not only has not improved, but it is estimated that it will deteriorate further in the near future as population growth and food requirements escalate. In 2005/2006, the food deficit amounted to 270 000 metric tonnes while in 2006/2007 it had reached a total of 386 000 metric tonnes, 318 000 of which attributable to the mountain regions (FAO, 2008b).

Rice, accounting for nearly 55% of total national cereal production, is the main cereal crop in Nepal: the increase in production over the

previous year in the 2007-08 season amounted to 16.8% giving a total of 4.3 million metric tonnes. As has already been seen, rice is also the main cereal crop as regards consumption. In the form of coarse rice it is the main staple food for poorer households (WFP, 2008a). Its market price is therefore a key indicator in order to monitor the national food security status.

As shown in Table 2, both the coarse and fine rice prices have significantly increased during 2008. Rice prices were already high soon after the harvest season, indicating that further increases were expected throughout the year, as indeed happened. Due to the late arrival of the monsoon rains, further food shortages are feared in Nepal and additional external assistance will be required (Bhandari, 2009; FAO, 2009b).

TABLE 2 - *Price changes of selected cereals in the three different agro-ecological areas of Nepal, Jan.-Jul. 2008 (prices in NPR/kg)*

	TERAI			HILLS			MOUNTAINS			% difference Terai- Moun- tains July 2008
	01/08	07/08	% change	01/08	07/08	% change	01/08	07/08	% change	
Coarse rice										
20.2	25	23.9		22.3	28.6	28.5	35.5	45.1	27.1	80.4
Fine rice										
27.9	34.1	22.3		29.4	37	25.8	43.2	51.4	19.0	50.7
Maize										
15.1	14.9	-1.3		14	17.6	25.4	27.4	34.6	26.5	132.2
Wheat flour										
21.1	23.9	13.2		25.9	29.7	14.6	48.6	54.2	11.4	126.8
Wheat grain										
16.7	16.8	0.7		17.3	19.8	14.5	18.9	21.6	14.1	28.6

Source: compiled from WFP/NDRI (2008).

The most recent data available, presented in Tables 2 and 3, illustrate the strong influence of the location of the market on the rate of increase in prices and the sharp contrast between the plains and the mountain.

Coarse rice prices registered steep increases in the short, six month period January-July 2008 of between 24 and 45 percent, depending on

the location of the market. Fine rice prices increased to a similar degree with the exception of mountain areas where the price hikes were even higher than those registered for the coarse rice.

Production of maize, the second cereal crop in terms of output, though not in terms of household expenditure on account of a high level of within household consumption, rose by 3.2% to 1.9 million tonnes. In the 2007-08 season, prices increased by 25% in the hills and 26% in the mountains (Tab. 3), although there was substantial stability, if not decrease in prices in the *Terai* mainly attributable to decent harvests and imports from India.

Wheat production also rose, by 3.8%, reaching 1.6 million metric tonnes in the 2007-08 season. Wheat accounts for 4% of household expenditure for food. The price increases for wheat, and its derivative wheat flour, were substantial in the first six months of 2008, though less dramatic than those for rice, ranging between 11% (mountains) and 13% (*Terai*) for flour, and between relative stability for wheat grain in the *Terai* to 14% increase in the mountains.

The data shown in Table 2 demonstrate the notable differences in price for the same commodity between the different agroecological zones. These were already high at the beginning of the six month period taken into consideration. For the unprocessed crops, coarse rice, maize and wheat grain, the price differences increased between the *Terai* and the mountain areas - from a difference of 76% for coarse rice in January 2008 to one of 80% in July but even more strikingly for maize where the differential rose from 81% at the beginning of the period to 132% six months later.

In contrast, for the more expensive processed products, fine rice and wheat flour, although the difference between the high price in the mountains and the lower one in the *Terai* remained notable (50% and 126% respectively) during the six month period of price increases, the differentials had narrowed from 54% and 130% at the beginning of the period. Many factors could have explained this phenomenon, but it seems very likely that demand for the more expensive processed products shrank in face of the drastic price rises in all food commodities.

2.4 - Pulses

Pulses, an integral part of the Nepalese diet, are widely used throughout the entire country and constitute an important item of protein intake. In terms of expenditure, they account for only 3% of food expenditure, since much of consumption is self-supplied. From this point

of view, price increases appear less important in terms of food security, at least in rural producing areas: more depends on productive performance which is quite low for Nepal (Tab. 5).

The main pulse variety consumed in Nepal is the lentil, with the three most important varieties known locally as *black gram*, *musuro* and *rahar*; however, chickpeas and beans are also frequently utilised. *Black gram* is mainly produced in the hilly areas of the country, while *musuro* and *rahar* are cultivated in the lowlands (*Terai*). For all kinds of lentils, a significant difference in price exists based on the location of sale, though these differences are lower than those for cereals and, as for most agricultural products, in the mountain areas of Nepal, the prices of pulses are considerably higher than in *Terai*. The price differential ranges from 37 to 52 percent, the only exception being for beans which are also locally produced in the mountain areas (Tab. 3).

The increase in the price of *musuro* provides an interesting case of the effect of cross border trade on local prices: this variety is traded with India and in 2008 it recorded a significantly higher increase than those registered for *black gram* and *rahar* (Tab. 3), reflecting scarcity of supply due to higher demand also in India, despite the prohibition of exports both by India and by Nepal in attempts to ensure supplies on their domestic markets. *Musuro*

2.5 - Vegetable cooking oils

Vegetable cooking oils, accounting for 11% of food expenditure, are the category of food products which registered the highest price increase in Nepal during the 2007-08 period. Substantial rises took place in all three zones of the country, but particularly in the mountains. The already sustained prices recorded in 2007 continued to increase in 2008, especially after the month of July.

Soybean oil, one of the main vegetable oils utilised in Nepal, registered a sharp increase. From January to July 2008, it rose on average by 30 percent (Tab. 4) with minimal differences between agroecological areas. The rise was, however, calculated on levels of initial price which varied significantly. Once more, the mountain areas recorded the highest prices which, in July 2008, were on average nearly 31 percent higher than those documented in *Terai*.

Price dissimilarities are to be found within the same agroecological area and can be attributed to the accessibility of the market. For example, in the mountain district of Jumla, although very remote, road

TABLE 3 - Price changes of selected pulses in the three different agroecological areas of Nepal, January-July 2008 (prices in NPR/kg)

TERAI			HILLS			MOUNTAINS		% difference	
01/08	07/08	% change	01/08	07/08	% change	01/08	07/08	% change	Terai- Moun- tains July 2008
LENTILS:									
Rahar									
63.3	73.1	16.0	69.8	76.6	9.7	92.8	105.5	13.6	44.3
Black gram									
62.0	65.7	6.0	66.4	75.4	13.5	85.9	99.6	16.0	51.6
Musuro									
58.0	69.2	19.3	60.5	72.5	19.7	76.4	95.0	24.4	37.3
BEANS									
54.4	61.2	12.3	57.2	67.8	18.6	41.7	61.7	48.1	0.8

Source: compiled from WFP/NDRI (2008).

access is available; hence the price of soybean oil in August 2008 was NPR 190/Lt. During the same month, the price of soybean oil in the mountain district of Humla, which is not accessible by road, was equal to NPR 280/Lt., that is, over 47 percent higher than in Jumla (WFP/MOAC/FNCCI/CIPE, 2008b).

3 - UNDERLYING FACTORS ENDANGERING FOOD SECURITY IN NEPAL

As has been noted in previous sections, the global rise in food prices has exacerbated the influence of a number of underlying factors, mainly of local origin, which endanger the nation's food security status. These factors, in particular, low agricultural productivity due to high input prices and scarce investment in the agricultural sector; limited road and market infrastructure; dependence on imports; population growth and years of internal conflict, are common to many LIFDCs, but will be briefly examined here in the context of the Nepalese economy before going on to analyse the adverse consequences on the population and to make some suggestions as to lines of action which could possibly improve the situation as regards food security in the future.

TABLE 4 - *Price changes of selected vegetable oils in the three different agro-ecological areas of Nepal, Jan.-Jul. 2008 (prices in NPR/Lt.)*

TERAI			HILLS			MOUNTAINS			% difference
01/08	07/08	% change	01/08	07/08	% change	01/08	07/08	% change	Terai- Moun- tains July 2008
Soybean oil									
101.6	128.2	26.2	107.0	139.5	30.3	126.6	167.7	32.5	30.8
Mustard oil									
115.0	130.0	13.0	110.0	142.5	29.2	-	-	-	-

Source: compiled from WFP/NDRI (2008) and FAO (2008b).

3.1 - Low agricultural productivity

Nepal is one of the countries in Asia with the lowest agricultural yields, especially as regards cereal crops. Productivity is significantly lower than that of neighbouring countries and other countries in the region. As shown in Table 5, rice, wheat and maize yields in Nepal are extremely low when compared to those registered in Vietnam and China. Yields of pulses are in line with those of India and Vietnam; however, they are almost one quarter of those in China.

TABLE 5.- *Average yields (Tonnes/Ha) of selected crops in Nepal, India, Vietnam and China, 2006*

Country		Rice	Wheat	Maize	Pulses
Nepal	Mountains	1.9	1.6	1.7	0.8
	Hills	2.5	1.8	2.0	0.8
	Terai	2.6	2.4	2.3	0.8
India	Uttar Pradesh	2.0	2.6	1.1	0.9
	Punjab	3.7	4.2	2.7	0.9
	Vietnam	4.9	-	3.7	0.7
	China	6.3	4.5	5.4	3.0

Source: compiled from CBS (2006) and FAOSTAT (2007).

Crop yields are also highly dependent on viable weather conditions: Nepal is a country which is subject to several natural disasters, some of them recurrent. Floods, especially those in the *Terai* region, cause substantial losses almost every summer as they affect the main agricultural production area of the country. On the other hand, droughts are also common, particularly in the hill and mountain regions. In these zones, irrigation facilities are very limited and the lack of rainfall can have disastrous effects on agricultural production.

3.2 - Marginal or low agricultural investment

Despite the importance of the agricultural sector for the economy of Nepal, investment in agriculture is very limited and does not contribute to the modernization of the segment. This results in obsolete farming techniques and low productivity.

Amongst the biggest constraints, the lack of access to credit for farmers is prominent. The high interest rates for credit are a major barrier to the development of agriculture, especially for small scale farmers.

Low agricultural investment results in limited availability of proper irrigation systems, a factor that could really have an impact on productivity and hence on household food security status.

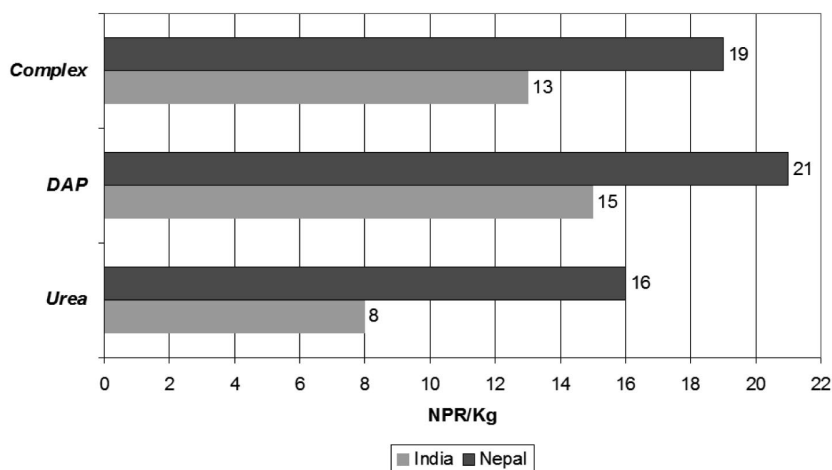
The lack of access to improved seed varieties is an additional constraint to production and it is faced particularly by farmers located in the higher hills and mountain areas of Nepal. Improved seed varieties together with appropriate crop management, are key elements for increasing agricultural productivity.

3.3 - Increases in input prices

The low productivity of the Nepalese agricultural sector is also a result of the limited use of fertilisers, which is the lowest in the region. The national average application of such products is 21 kg per hectare, an extremely low value compared to India (98.6 kg/ha), Bangladesh (156.3 kg/ha), China (255.6 kg/ha) and Japan (301 kg/ha). All fertilisers utilised in Nepal are imported (mainly from India) and their application has decreased substantially after 1999, when government subsidies were abolished. As a consequence of this, fertiliser use on a per hectare basis dropped by 5 kg compared to 2003 when its national average utilisation was equal to 26 kg/ha (MoAC, 2006).

During the 2007-08 period, international fertiliser prices grew significantly on world markets. In addition to that, a vast price difference between Nepal and India (Nepal's main fertiliser supplier) has always existed. For example, already in 2006 the price of urea in Nepal was double that of India. Similarly, the cost of DAP² and complex fertilisers were 40 and 46 percent higher respectively (Fig. 2).

FIG. 2 - Prevailing fertiliser prices (NPR/kg) in India and Nepal during 2006



Source: compiled from Thapa (2006).

World oil prices reached their record during 2008. Although highly subsidised, prices of petroleum derivatives in Nepal also increased substantially, as shown previously in Table 1. The Nepal Oil Corporation (NOC), the state owned company controlling fuels, has been facing a monthly NPR 1.5 billion loss despite a revision of fuel prices and their subsequent increase. The massive loss is also reflected in the availability of fuels throughout the country. Supplies are limited and unable to meet the actual demand.

During the first six months of 2008, the average cost of transport in Nepal has increased by 27 percent and further increases are expected (WFP, 2008b).

² DAP = Diammonium phosphate

3.4 - Limited road and market infrastructure

Given the topographic characteristics, as well as the limited infrastructure available, accessibility of remote areas is a considerable issue in Nepal. The difficulties that exist in reaching several districts of the country (especially in the Mid and Far Western Regions), together with the problem of high fuel prices, have a direct impact on the prices of agricultural commodities. Frequent road blocks and protests, locally known as *bandh*, also have consequences on the transport of agricultural products and subsequently on their prices in the market place. The difficulty of delivering food consignments and the high costs involved, claim a significant share of the final prices paid by consumers.

The significant regional variations in food prices analysed in the previous section are due mainly to difficulties in transport. Moreover, as shown by Doward *et al.* (2004), weak infrastructures, especially in landlocked countries, result in significant volatility of prices of agricultural commodities.

3.5 - Export measures and Nepal's dependence on imports

Being a food deficit country, Nepal is heavily dependent on imports in order to satisfy its needs, especially those related to cereal consumption.

Nepal's main source of imports is India and the prices of many agricultural commodities fluctuate depending on their availability in the exporting country. Even more important for Nepal are India's export restrictions or bans. In 2008, India banned the export of non basmati rice, wheat and lentils as a measure to protect its own population from the global food crisis. The consequences for Nepal were exceptional increases in prices and limited availability of the cereals on local markets. By force of circumstance, the Government of Nepal responded with an export ban for cereal grains in an attempt to limit the adverse effects of the pre-existing deficit.

3.6 - Population growth and rising demand for food

The population of Nepal is growing at a fast rate as compared with the growth of the agricultural sector. The latest figures show that from 1990, the population in the country has grown by 8.5 million to 27.7 million (UNFPA, 2008). The 2 percent annual growth of the population

is just slightly below that of the agricultural GPD which averaged 2.8 percent per annum in the 2000-06 period (FAO/WFP, 2007). The existence of such a narrow difference between the annual growth of population and agricultural GPD creates a very high pressure on both land and productivity.

The expansion of the population results in a direct increase in the demand for food. Given the fact that mountains occupy 35 percent of Nepal and only 2 percent of that area is suitable for cultivation, further expansion of agricultural production has to take place mainly in the *Terai* and hilly areas of the country. The latter agroecological zones also host nearly 93 percent of the total population with trends indicating further urbanization and consequent loss of cultivable land.

3.7 - *Internal conflict*

Nepal has suffered a decade-long internal conflict, the result of a turbulent political situation that considerably affected the economy of the country, including agricultural activities. Market access, storage and transportation of agricultural goods were severely affected during the period.

With the peace agreement which entered into force towards the end of 2006, good prospects for the rehabilitation of the agricultural sector exist. Normal agricultural production of staple crops has resumed and transport infrastructures such as roads and bridges are being repaired.

4 - CONSEQUENCES OF INCREASED FOOD PRICES IN NEPAL

In a study undertaken in the early phases of the period of sharp price increases and published in July 2008, it was estimated that the rise in food prices in Nepal would have a detrimental effect in terms of household food security on a total of 19.2 million rural people, 9.7 million of which affected in a significant way. Overall, 83.4 percent of the rural population of Nepal is negatively affected by the rise in food prices while only 16.6 percent (3.8 million people) will either marginally or significantly (2.3 percent) benefit from it.³ In urban centres, us-

³ The estimates are based on data gathered through the WFP Food Security Monitoring and Analysis System and the statistical analysis is based on a methodology suggested by Deaton (1989); it refers to a food vulnerability index based on access to land, food expenditure as percentage of total expenditure and percentage of income deriving from the sales of agricultural produce.

ing a different methodology, the percentage of people at risk was considerably lower, estimated at between 67,000 and 525,000 (WFP/NDRI, 2008).

Whereas in July 2008, the report referred to above estimated the number of rural people in need of food assistance, one year later, the figure had risen to 3.4 million (World Food Programme News, 7th August 2009).

The phenomenon of soaring food prices in Nepal results in the increase in overall poverty and, as a result, malnutrition throughout the country with particular areas such as the mountains being more vulnerable than the others. In Nepal, malnutrition levels, especially for children, are amongst the highest in Asia (Pan, Fang, Rejeus, 2008). Stunting affects 49.3 percent of the children while the proportion of underweight is equal to 38.8 percent. Wasting, another indicator of acute malnutrition, affects 13 percent of the children in the country (WHO, 2006)⁴. In the same way as for food price trends, malnutrition is also geographically uneven. The mountain areas, particularly those of the Mid- and Far-Western development regions, are those with the higher prevalence of malnutrition, and a further rise in food prices will result in additional deterioration of the household food security and nutritional status.

As in the case of other LIFDCs, foreign donations of food aid aimed at providing supplementary assistance to lower income consumers have been affected, due to the severe erosion of purchasing power and the fact that food aid donors operate on yearly budgets which are not able to absorb spikes in prices (Trostle, 2008b; Hoddinott, Cohen, Barrett, 2008). For these reasons, the progress in poverty reduction that has slowly been taking place in Nepal, could be reversed.

The soaring food prices in Nepal have multidimensional consequences on the food security status of the country. In particular, the coping strategies adopted by the most vulnerable segments of the pop-

⁴ The World Health Organization (WHO) utilises values of child underweight, stunting and wasting as indicators of nutritional status in a community as these are internationally recognised as important public-health indicators for monitoring health in populations. In addition to this, children suffering from growth retardation as a result of poor diets tend to have a greater risk of suffering illness and death.

The WHO maintains the Global Database on Child Growth and Malnutrition, which includes population-based surveys that fulfil a set of criteria. Data are checked for validity and consistency and raw data sets are analysed following a standard procedure to obtain comparable results. Prevalence below and above defined cut-off points for weight for age, height for age, weight for height and body mass index (BMI)-for-age, in preschool children are presented using a z-scores based on the WHO Child Growth Standards (WHO, 2009).

ulation of Nepal consist in the adoption of strong household management strategies, most of which are highly detrimental for the long term sustainability of the affected family.

Migration, within and outside Nepal, is increasing as food prices rise and household food stocks become depleted. This is especially the case of the most affected populations living in the mountain and high hill areas of the country where transport and access to food is limited. Migration to *Terai* is increasingly common and in some cases, it also goes beyond the national border, mainly to India. Migration to India is usually undertaken in order to secure a temporary occupation, usually as manual labourer, so as to collect some cash and later return to the household site. The latter issue is directly interlinked with the increasing occurrence of HIV/AIDS amongst the rural population in the Mid- and Far-Western development regions of Nepal.

Another detrimental strategy adopted in response to increasing food prices is the reduction of food intake. This results in the deterioration of the already poor diet since in some cases, both the quality and quantity of the food is reduced. In terms of quantity, in Nepal the average rural household intake is 2540 calories per day per person which is lower than the recommended 2800 calories per day for an adult male in India (Waterlow and Payne, 1990; Logan 2007). As for the qualitative aspect of food, price hikes also result in raised micronutrient deficiencies (Von Braun, 2008).

The increase in food prices in Nepal also brings consequences in the education sector. In fact, under pressing situations, children are forced to leave school in order to engage in work activities so as to help the family raise their income with the purpose of being able to purchase the food needed.

A further detrimental coping strategy which results from the inaccessibility of food due to its price is indebtedness. Households which face food insecurity are likely to borrow either cash, or if possible, food items directly, which must be returned at a later stage with substantial interest added.

Selling household or agricultural assets are other options which are induced by increased food insecurity status. In some cases, even women's jewellery, which is amongst the most important assets of Nepalese women, is sold in order to fetch cash.

In the worst case scenarios, when no other coping strategies can be implemented, the most affected segment of the population is forced to skip meals or even beg.

As in several countries of the African, Asian and American conti-

nents, Nepal too is susceptible to potential civil unrest, including riots, which originate from the inaccessibility to the local population of staple food items.

5. - CONCLUSIONS AND RECOMMENDATIONS

Although the economy of the rural areas is mainly based on subsistence agriculture Nepal is a food importing country. Due to the very limited average size of land holdings, the majority of the farm households in the country are, however, net consumers of agricultural products. At the same time, the growing urban population requires food production from rural areas in order to satisfy its demand. As a consequence, the food security status of both the urban and the rural population depends on the availability of imports and is susceptible to changes in food prices, whether these be domestically or internationally induced.

The actions and the processes involved in order to seek to alleviate the current precarious food security conditions, are multifaceted and in some cases lengthy. Given the urgency of the problem, as well as the complexity of the numerous challenges faced by the agricultural, market and economic situation of Nepal, measures that could be adopted to improve the situation in the country are best categorized on the basis of the timing and duration of their implementation. Consequently, strategic responses can be divided into immediate or short-term, mid-term and long-term.

The immediate or *short term strategic responses* to soaring food prices in Nepal that could be adopted instantaneously in order to deliver results in the very short term, include, for example:

- Improvement of the governmental agricultural market and price monitoring system in order to allow a *closer monitoring* of the food security and vulnerability situation in the different districts and agro-ecological areas of the country. This would allow the creation of a solid database from which programmes for intervention aimed at the reduction of household food insecurity could be developed.
- *Improved access to agricultural inputs* (fertilisers, seeds etc.). In the case of farmers in the neediest districts, for example several high hill and mountain districts, subsidised prices, with appropriate monitoring, might be introduced.
- The creation of *adequate food reserves in strategic locations* in the food deficit districts.

- The provision of *direct subsidies for the purchase of food items* in the districts which are most affected by significant price rises, with appropriate controls to prevent abuse of the system.

The *mid-term strategic responses* include actions that require a moderate amount of time in order to be planned and implemented, such as:

- *Exploitation of the country's broad range of agro-ecological zones in order to identify the comparative advantages that each zone possesses* in terms of suitability for production of specific crops. Agricultural commodities which have the highest development potential should be identified in order to concentrate efforts on the most promising crops. For instance, the mountain areas possess a comparative advantage for animal raising, the production of temperate fruits and nut crops as well as medicinal and aromatic plants. Hill areas are best suited for off-season vegetables as well as fruits, spices and seed production, while *Tera*i has a comparative advantage in terms of cereals, oilseed, vegetables and sub-tropical fruits.
- The promotion of the creation and utilization of *adequate seed storage facilities at the local level*. These will ensure the existence of seed stocks which would be properly stored and hence possess good physiological and physical properties, including a satisfactory germination rate, which is essential. In Nepal, adequate storage facilities for seeds are extremely important especially during the monsoon season when most seeds are lost due to post-harvest contamination.
- The *improvement of farmers' access to credit*. This would allow producers to invest in agriculture through the purchase of improved seed varieties, livestock, fertilisers and tools. Credit would also permit the construction of small-scale or micro-irrigation systems as well as the adoption of simple improved agricultural technologies.
- *Rehabilitation of farmer-managed irrigation systems* in order to reduce the vulnerability deriving from adverse climatic conditions such as droughts and floods. Availability of irrigation facilities would also have a significant beneficial effect on crop productivity.
- Promotion of increased domestic production through the *expansion of production amongst existing small-scale farmers*. Agricultural activities could be intensified in pre-existing farms, especially those managed by small farmers where overall increases in food production can make a significant difference in terms of household food security.
- *Creation of on-farm experiments* in order to assess the most appropriate crop rotation cycle and cropping intensity for different agro-ecological areas and elevations.

- *Improvement of farmers' access to information*, especially in relation to agricultural markets so that production can be adjusted in accordance with national demand and changing market conditions.

The *long-term strategic responses* to soaring food prices in Nepal should include mainly government actions aimed at support in the long term and sustainability of the agricultural sector. Their implementation is a complex process which requires considerable time and efforts but could deliver results which would have enduring beneficial effects. Amongst these could be:

- *Increased investment in agriculture* by both the government and private sector through the creation of reforms, incentives, price and trade policies.
- Development of *appropriate and feasible local agricultural technologies* to be implemented by small and large scale farmers.
- Development of *rural infrastructures*, especially with regards to road connectivity between different districts and agro-ecological areas. In particular, North to South road linkages should be established as several high hill and mountains areas are not connected to the main markets of the hills and *Terai* where most of the exchanges of agricultural products take place. Rural infrastructures would allow improved access to markets.
- Promotion of *high value perennial and cash crops* through the provision of support to horticultural marketing clusters, the establishment of nurseries and the selection of areas which are most suited to the plant species. Ideally, these areas will be accessible by road so as to ease market access.
- *Rehabilitation of pre-existing structures and establishment of new food processing and handling facilities*. Likewise, programmes on post-harvest technology and management to minimise losses while enhancing availability should be expanded. The latter would result in the reduction of consumer prices.
- Promotion of optimal land utilisation in order to *discourage the use of agricultural land for non-agricultural purposes* as well as to limit urbanisation of the most fertile areas.
- Investment in agricultural infrastructure such as *drainage and flood control structures* in addition to soil and water conservation measures.
- *Strengthening and application of research in the seed sector* by selecting, multiplying and distributing to farmers the most promising and well adapted varieties of cereals, legumes, fruits and cash crops. Crop

diversity should be supported in accordance with adaptation to different agro-climatic conditions. Dependency on few crops should be avoided and alternatives should be sought. For example, potato, a high yielding crop with a long shelf life which is well adapted to Nepal's conditions, should be further promoted as a valid alternative to other crops which are also a source of carbohydrates.

The mid-term and long term strategies suggested here provide examples of concrete opportunities for forms of investment in agriculture, the importance of which has, in the past, been underestimated by theorists of economic development (Pingali and Stringer, 2003). Formerly, agriculture has been seen as a source of resources to be mobilised for industrial investment. More recently, however, there has been greater emphasis on the role of investment in agriculture on account of the many cross-sectional linkages through which agricultural growth supports overall economic growth. As pointed out by Pingali, Stringer, Stamoulis, (2006), the role of agriculture in reducing poverty and hunger is increasingly recognised yet still insufficiently addressed and in many circumstances, public investment fails to reflect the importance of agriculture..

The measures suggested here would gradually lead Nepal to a greater degree of food self-sufficiency and thus strengthen the country's defence in the case of events on world markets which could endanger its essential food supplies and the food security of large sections of the population.

The basic causes of food insecurity in Nepal – low agricultural productivity, lack of investment in agriculture and rural infrastructure, population growth in excess of increases in food production, internal conflict, are shared by many other low income food deficit countries. Each of them is linked to the others in a merciless spiral that can be broken only by decisive and well-gauged action on the part of local governments, aided, hopefully, by the international community.

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Summary

Soaring food prices and food security in LIFDCs – the case of Nepal (JEL: Q18)

The paper examines the effects of the phenomenon of soaring world food prices in a typical Low Income Food Deficit Country (LIFDC), Nepal. Steep rises in the prices of agricultural products are rare in Nepal and the outcomes of events on international markets have been exacerbated by a number of factors both of local and international origin, leading to a decline of the food security status of the most vulnerable households.

The paper begins with a brief account of the recent evolution of rising commodity prices on world markets, providing global statistics for major agricultural products. A detailed analysis of the internal causes that have led, at the same time, to substantial increases in food prices in the Nepalese domestic market follows, and the detrimental repercussions on the food security status of households is described, together with the possible further consequences in the immediate future. The paper provides suggestions and recommendations for countervailing actions to be taken in order to tackle the issue of food insecurity at the grass root level so as to mitigate its effects, with special regard to the most vulnerable strata of the population, distinguishing between strategies applicable in the short, medium and long term.

