SPATIAL VARIATION OF FOOD INSECURITY AND VULNERABILITY DIMENSIONS OF SRI LANKA

Wasanthi Wickramasinghe

Abstract

Sri Lanka has shown remarkable improvements in health and education indicators compared to other South Asian countries. Yet, malnutrition continues to affect the growth of children and the productive capacity of the population in Sri Lanka. Eliminating hunger and food insecurity has been the foremost priority of successive governments in Sri Lanka. However, the availability of the total per capita calorie for consumption has not increased as in the neighbouring countries and the economic growth is merely confined to the urban centres causing income disparities and rural poverty. Poverty associated deprivation in access to food, inadequate sub-national food production, lack of market integration, cultural and livelihood related food habits and lack of awareness on nutrient aspects of food are important determinants of inadequate energy and nutrient intake by many Sri Lankans. The marked geographical variation in the malnutrition status across the country shows that the importance of different dimensions of food insecurity and vulnerability is spatially varied.

***Key words**: Food insecurity, vulnerability, poverty, malnutrition*

The Need to Address Food Insecurity and Vulnerability in Sri Lanka

Sri Lanka has shown remarkable improvements in many social indicators compared to other South Asian countries, particularly in relation to health and education indicators. Life expectancy, infant mortality, child mortality and maternal mortality are comparable to many developed countries. Literacy rate is relatively higher compared to other countries in the South Asian region. Nevertheless, comparative malnutrition statistics from the developing countries in Asia show that Sri Lanka does not comply with the same status that Sri Lanka has achieved for health and education indicators, and malnutrition still affects nearly a quarter of the children in Sri Lanka (DHS, 2006/07). Low birth weight continues to be a major problem, and iron deficiency anaemia, vitamin A deficiency and iodine deficiency are common nutritional problems widely spread in the country.

Owing to the fact that malnutrition burdens a nation by accruing a heavy cost on medical facilities which could have been invested in more productive sectors, and by lowering the economic growth of a country due to less productive capacity of its population, eliminating hunger and food insecurity of its population becomes the primary objective of any development agenda of a country. Food and nutrition security is a primary concern in any society and it is a basic human right.

In Sri Lanka too, increasing food production to ensure food security for its people has been a higher priority of every government since independence. Paddy production increased over the years enabling to meet 90–95 percent of the national rice requirement, the staple food of the people. Sri Lanka is a country that has not suffered famines and food shortages in recent history. However, the food insecurity situation with respect to Sri Lanka is illustrated by the fact that, about 22 percent of the Sri Lankan population are undernourished and do not receive minimum daily energy requirement of 1885 calories per day, according to the FAO estimates and it is below average within the region. Food insecurity with respect to the poorer segment of the population is still worse. Nearly one-fourth of the population in lowest income quintile does not receive 80 percent of the minimum adequate daily calorie requirement (1612 calories) and is at the risk of malnutrition (CF&SE, 2003/04).

Dimensions of Food Insecurity and Vulnerability

Intense conceptual debate about the definition of food security over the years, tried to find solutions for eradicating hunger and malnutrition. The definition of food security and nutrition security has been evolved considerably over the years to include different dimensions of food security so as to address food insecurity and malnutrition in the national development agenda and in the development assistance programmes. The World Bank definition of food security in 1986 emphasised more on the dimension of access to and availability of food at national, regional and household level. However, in 1992, the term food was further specified as energy, protein, fat and micronutrients and also not only as quantity but also as quality, safety and cultural preference. The 1996 World Food Summit adopted a still more complex definition:

"Food security, at the individual, household, national, regional and global levels [is achieved] when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life."

This definition was further refined in The State of Food Insecurity, 2001:

"Food security [is] a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life."

Food insecurity exists when people are undernourished as a result of the physical unavailability of food, their lack of social or economic access to adequate food, and/or inadequate food utilisation. Food-insecure people are those individuals whose food intake falls below their minimum calorie (energy) requirements, as well as those who exhibit physical symptoms caused by energy and nutrient deficiencies resulting from an inadequate or unbalanced diet or from the body's inability to use food effectively because of infection or disease.

Following the above definition, different dimensions of food insecurity have been identified by FAO as follows (FAO, 2003):

- Lack of availability or unavailability of food for consumption
- Lack of access or no access to food - financial difficulty to acquire food
- Non-utilisation/Under-utilisation - inadequate dietary composition of the available and acquired food, to the proper use of this food and to the effective digestion and absorption of what is consumed
- Instability-lack or inability of households to meet their dietary needs year-round
- Inability of households to ensure the long-term stability of the household food supply

On the other hand, vulnerability refers to the full range of factors that place people at the risk of becoming food-insecure. The degree of vulnerability of individuals, households or groups of people is determined by their exposure to the risk factors and their ability to cope with or withstand stressful situations.

Malnutrition Status and Food Insecurity and Vulnerability Dimensions of Sri Lanka

Though the child survival in Sri Lanka has increased due to the increased public health services and widespread immunisation programmes over the last few decades, those reaching their full potential in growth and development remains low, which is greatly influenced by environmental factors such as nutrition and sanitation. Malnutrition is an outcome of various factors and it is more than inadequate energy and nutrient intake. Physiological status of an individual for his ability to absorb nutrients from food he consumes also considerably affects the malnutrition status. However, proper nutrition at various stages of life from foetal growth to adolescent growth and the nutrition during pregnancy are vital for full potential growth and development of the individual who is a productive asset for the country.

Some improvements in the height and weight are observed among school children especially in the more deprived segments of the population during the last few decades. Underweight, a good indicator showing the prevalence of general malnutrition in the country has come down from 57.3 percent in 1975-76 to about 21.6 percent in 2007.

Table 1: Malnutrition Status of Pre- School (0- 5 years) Children

Year	Stunting	Wasting	Underweight
1975 - 76	44.9	13.9	57.3
1977 - 78	44.6	13.9	54.3
1980 - 82	36.2	11.6	43.0
1987	27.2	11.6	37.3
1993	23.8	15.5	37.7
1996	16.1	12.8	30.7
2000	13.5	14	29.4
2001	14.2	14.2	29.9
2006 - 07	18	15	21.6

Source: Piyasena C, Mahamithawa, AMASB, 2003, DHS 2006/07

Stunting which has been considered as a useful malnutrition indicator of long-term social deprivation has declined from 44.9 percent in 1975-76 to about 18 percent in 2007 (DHS, 2006/07). Wasting, however, remains relatively static throughout the last few decades. This shows the prevalence of short-term starvation of children which is common among children in the rural sector. Low birth weight is considered as the most significant factor leading to high prevalence of under nutrition among children. The recent trends on malnutrition indicators however are not grounds for optimism, and according to the nutrition policy document, it would take more than twenty years to bring underweight to less than 10 percent with the increasing population.

The nature and severity of food insecurity shows a wide variation within Sri Lanka. There is a marked geographical variation in the malnutrition indicators related to food insecurity and vulnerability across the country stemming from various reasons. Worst malnutrition status is observed in the Moneragala, Badulla, Nuwara Eliya and Kandy districts. Underweight and stunting (chronic under nutrition) among pre-school children are largely spread in those districts. Stunting which is considered as a useful malnutrition indicator of long-term social deprivation could result from deficit of any nutrient, especially good quality protein, calcium and zinc for long term although energy deficit is the more important cause (Wickramanayake, 2002).

Energy adequacy and dietary diversity are important parameters that determine the malnutrition status of an individual. Earlier studies have shown (Nanayakkara & Premathilake, 1987) that, in Sri Lanka, if energy adequacy could be met, then the protein adequacy is already achieved. Therefore, staple food production was given the highest priority by successive governments in Sri Lanka and promising results have been achieved. But, it is observed that in areas where the diets are having adequate energy, but low dietary diversity is the worst shown in the malnutrition status of Sri Lanka. Deriving energy largely from staples, therefore does not guarantee the nutrient adequacy of the individual, particularly the vulnerable groups like pregnant mothers, lactating mothers, and children. According to the HIES, the highest average calorie intake is observed in the Nuwara Eliya district where more than 65 percent of the energy is derived from staples (Table 2). Therefore, the total calorie intake and dietary diversity are important parameters of food insecurity that guarantee not only energy-protein adequacy, but also the adequacy of micro-nutrients and good quality proteins.

Table 2: Average Calorie Intake, Dietary Diversity and Malnutrition Status

District	Average calorie Intake[1]	Percentage Population below minimum calorie requirement[1]		Percentage energy from staples[2]	Dietary diversity index[2]	Stunting[3]	Wasting[3]	Under weight[3]
		Male	Female			%	%	%
Gampaha	2055	54.7	54.3	0.42	0.38	5.8	10.3	19.2
Colombo	2031	54.9	58.1	0.39	0.41	6.4	10.4	24.2
Kalutara	2078	52.1	56.6	0.46	0.35	13.2	10.6	22.8
Galle	2073	54.9	55.5	0.48	0.33	8.2	11.2	22.4
Kegalle	2005	59.2	58.7	0.54	0.32	4.7	11.6	23.3
Matara	2031	55.0	58.2	0.53	0.29	19.7	14.1	22.5
Matale	2030	58.5	59.1	0.55	0.30	8.0	20.0	20.0
Kurunegala	2103	49.1	52.8	0.54	0.34	8.3	23.0	25.1
Ratnapura	2136	47.2	47.2	0.59	0.28	9.6	11.5	24.9
Puttalam	1998	59.3	63.2	0.50	0.36	14.6	12.4	34.6
Kandy	2143	50.4	47.0	0.53	0.31	20.5	21.4	39.3
Anuradhapura	2209	44.7	45.1	0.56	0.33	10.0	16.9	35.6
Polonnaruwa	2309	37.3	40.7	0.59	0.29	14.6	18.3	39.0
Hambantota	2067	53.2	37.3	0.58	0.28	8.3	22.4	32.8
Moneragala	2208	46.0	39.6	0.62	0.29	22.1	26.7	46.5
Badulla	2143	47.7	45.1	0.64	0.24	39.0	14.3	44.8
Nuwara Eliya	2519	28.7	23.4	0.66	0.24	27.5	14.7	44.1

Source: [1]HIES, 2002,[2] Wickramasinghe, 2008,[3]Piyasena C, Mahamithawa, AMASB, 2003

Stunting is highly associated with estate children born underweight to estate mothers who are vulnerable to deprivation during pregnancy.

Due to short-term starvation of children, acute under nutrition (wasting) is widely spread among children in rural areas. Seasonality in food production in the rural sector makes it difficult for the rural households to meet their dietary needs year-round. The Moneragala district is the worst in terms of acute under nutrition and underweight. Although the average calorie intake in the main producing areas such as the Polonnaruwa, Anuradhapura, Hambantota and Kurunegala districts is relatively high, the short-term starvation of children is evident largely from the prevailing acute under nutrition among children (Table 2).

In order to design policy intervention strategies and to formulate development projects to better answer the question of food insecurity and vulnerability, it is fundamental, therefore to find the causal factors hindering adequate food and nutrient intake by different communities and their spatial variations. The analysis carried out by following conceptual framework developed by the FAO, shows that dimensions of food insecurity and vulnerability are important in identifying the causal factors. The two analyses carried out by the Food Insecurity and Vulnerability Information and Mapping System (FIVIMS) have shown that consideration of food availability dimension, access to food dimension and utilisation dimension in isolation are more appropriate for developing policy guidelines for decision makers (De Silva, 2007; Wickramasinghe, 2008). Poverty associated deprivation in access to food, inadequate sub-national food production, lack of market integration, cultural and livelihood related food habits and lack of awareness on nutrient aspects of food are important determinants of inadequate energy and nutrient intake by many Sri Lankans. This paper deals with the two important dimensions; food availability dimension and access to food dimension of food insecurity and vulnerability and its spatial variation across different geographical areas.

National and Sub-national Food Availability

Of the different indicators considered in different definitions of food security, it is meaningful to consider the food availability dimension more at national and sub-national levels rather than at household level. Making available sufficient, safe and nutritious food to meet the dietary needs and food preferences either by means of local production or by imports is a primary objective of the agricultural policy in a country. The efforts to increase domestic food production have been made and the achievements have been very significant, particularly in rice and vegetable sub-sectors. Attention was mainly given to rice, the staple food of the people in the country so as to meet the energy requirement of the population. The country had produced only 38 percent of its total requirement of rice in 1953,

when the population was only 8.0 million, but today it has achieved more than 95 percent self-sufficiency, feeding 19.5 million people. However, the demand for food is rising annually, largely as a result of population growth, changes in the population structure and income growth. Thus, the agricultural sector faces the challenge of meeting this increasing demand for food.

With the increased domestic production; particularly rice and the capacity to import what is in short supply under the more liberalised trade regime and open market situation, Sri Lanka is in a fairly satisfactory position in regard to the national food availability of staple food commodities. Nevertheless, agricultural policy had not been favourable for increasing overall food production growth and to reduce the dependency over the imported food commodities. The food production growth experienced in Sri Lanka is relatively low compared to that of the South Asian region and Asia in the recent decades. The total calorie availability for consumption has increased marginally, compared to the neighbouring countries and the dependency over the imported staple food commodities are relatively higher compared to the region (FAO, 2005).

Table 3: National Food Availability Indicators

Indicator	1990-2000	2001-2003	Latest
Average per person dietary energy supply (kcal)	2318.5 (2000)	2331.1 (2002)	2363.4 (2005)
Animal protein supply per person/ day (grams)	18.14 (2000)	18.11 (2002)	15.48 (2005)
Food production index	101.7 (2001)	101.4 (2002)	102.8 (2005)
Rice self-sufficiency ratio	100 (2001)	98 (2002)	98 (2005)
Per capita rice availability (kg/yr)	94.53 (2001)	98.09 (2002)	97.30 (2007)

Source: Food Balance Sheets, Department of Census and Statistics, FAOSTAT

Dependency over wheat based products, powdered milk and other imported foods has increased the food import bill (Various Issues, Central Bank of Sri Lanka) which is not advantageous when macro economy of Sri Lanka is concerned. Thus, a more conducive policy environment is needed to develop to increase resource allocation towards the national food production programme in the long run. At the same time, complementary short-term policies are also important for the assurance of the availability of basic food commodities at affordable prices. Consumer food habits should also be promoted to consume more locally produced foods in order to facilitate a market for local producers. Particularly, estate communities and Tamil communities in the northern region are largely depended

on wheat based products, while urban related food habits are also considerably over wheat based products.

Marketing systems in Sri Lanka are characterised by lengthy marketing chains, limited market competition (especially at farm level), lack of integration among market participants, poor road conditions and lack of organisation amongst farmers. These factors have resulted in wide-price differentials between producers and consumers. As farmers are hardly organised, collectors and traders play a dominant role in collecting farm produce from farmers and preparing bulk purchases for wholesalers. At the time of harvest, the markets are advantageous to buyers as supply exceeds demand. Storage facilities are noticeably lacking and thus farmers are often in urgent need of cash (Ministry of Agricultural Development and Agrarian Services, National Programme for Food Security, 2007). This has resulted in misallocation of resources for achieving a growth in the food production sector.

The sub-national food availability dimension becomes important when food prices, consumption and dietary patterns and the nutritional security of different regions and communities are concerned. Different consumption patterns of urban, rural and estate sectors in different districts show that the regional food availability, food habits related to ethnicities, cultures and livelihoods play a vital role in addition to food prices in determining food consumption patterns. The food availability in a particular region is determined by food production within the region, production instability and the strength of market infrastructure (Wickramasinghe, 2008). Market is the principle means of food availability in the urban districts such as Colombo, Gampaha and Jaffna where market infrastructure is well established. Therefore, the price is highly sensitive to urban poor who is totally depended on market for food needs. On the other hand, the local food production is the main determining factor of food availability in the districts where poor market infrastructure is in place. Even the main producing areas suffer food shortages by different food groups. The vulnerability status derived by considering the food availability by all food groups shows that the surplus paddy producing areas such as Anuradhapura and Polonnaruwa are not as secure as Colombo and Gampaha in terms of food (Wickramasinghe, 2008).

Therefore, in order to make available sufficient, safe and nutritious food to meet the dietary needs and food preferences of regions and communities at affordable prices, it is important to have regional food production programmes. The idea of 'sub-national food self-sufficiency' makes significance in terms of food availability of many districts where the market cannot assure of the food needs of the region. Regional food production programmes must be targeted to cater for the nutrition security of each income level in the region by means of production of alternative food commodities. It is noted that the rupee value of different energy

and protein food groups is highly significant and therefore is a good indicator to determine the food production programmes at regional level. Home gardening, livestock development and inland fisheries programmes are some of the important programmes identified.

Food supply stability is also an important factor that determines the food prices at large. In addition to natural calamities such as drought, floods, land slides, the escalation of crisis situation in the war-affected areas has been another contributory factor in Sri Lanka. Drought is a recurrent phenomenon and production instability is mainly caused by drought in Sri Lanka. Production instability is high, particularly in the main producing areas such as Kurunegala and Hambantota where rural farmers are becoming vulnerable to food access during unfavourable years. There is an urgent need to establish an institutional mechanism to assess the risk associated with drought and to assess the production instability and the consequent price instability. Disruption of the food distribution network due to reasons such as natural calamities and man-made reasons cause sudden food price hikes and price instability. Particularly, Jaffna becomes critically vulnerable in terms of food availability at times of road closure where the main market is the principle centre of food availability in the district.

Household Food Security and Access to Food

While adequate food supplies are a necessary condition for food security, weak purchasing power of the households hampers access to food. Household food security or food entitlement in a market economy is determined by the fact that how much exchange capacity each household has in terms of access to food. The capacity of the household economy to have access to food on the other hand depends on the livelihood opportunities by means of employing resources/assets and labour.

Despite several set-backs in the economy, Sri Lanka was able to maintain a growth rate of about four to six percent during the recent past. Per capita income of an average Sri Lankan has increased, that the country is now falling into the category of lower-middle income countries following the classification of the World Bank. Moreover, economic growth has merely been confined to the urban centres, and it has not trickled down to those living in peripheries. Particularly, the economic growth has been centred in the Western province of the country where more than 58 percent of the urban population live in. Due to the more urban- bias growth that took place during the past few years, the gap between the rich and the poor has widened. In the Western province, the household income is much higher than the other provinces. Particularly, the Uva and Sabaragamuwa provinces continue to receive the lowest income compared to other provinces. Therefore, though the economy grew in real terms, rural poverty is a widespread

persistent phenomenon. Rural poverty remains as high as 24-27 percent in the Sabaragamuwa and Uva provinces that one-quarter of the population in those areas is living in poverty, who do not receive an adequate income to meet their daily food needs (HIES 2006/07). Poverty associated deprivation in access to food is exemplified by a large number of households earning low income, thus severely limiting their purchasing power, and consequently the average percentage of household income spending on food remains high. Food is the main item in their household budget, while as much as 50 percent of the total household income is spent on food by nearly 50 percent of the population (CFSC, 2003/04).

Regional characterisation of poverty in Sri Lanka shows that household is more likely to be poor if it belongs to a district with the lower average access to markets, lower proportion of households using electricity, higher proportion of household heads with education below primary level or employment as agricultural workers. These spatial factors become more important at a more disaggregated level that a unit improvement in the average accessibility index of a DS division reduces the probability of a household located there to be poor by 12 percent (Ambar Narayan, 2003). Meegahakivula, Rideemaliyadda, Kandaketiya, Lunugala and Mahiyangana DS divisions in the Badulla district, Siyambalanduwa, Madulla and Thanamalvila DS divisions in the Moneragala district, Wilgamuwa, Ambanganga Korale and Laggala-Pallegama DS divisions in the Matale district, Udadumbara DS division in the Kandy district, Vanathavilluwa DS division in the Puttlam district and Weligepola and Kolonna DS divisions in the Ratnapura district have been identified as critically vulnerable DS divisions in terms of having less coping capacities to make a living (Wickramasinghe, 2008).

Livelihood is the key determinant of the income disparity in the country. Rural poor who are primarily depended on agricultural livelihood are the most vulnerable in terms of access to food. About 88 percent of the lowest income group reside in rural areas while eight and four percent live in urban and estate areas respectively. A large percentage of rural households -- higher among the poorer -- remain heavily dependent on income from agricultural activities. Relative dependence on agricultural income is higher where agricultural households are predominant. Income from agriculture accounted on average for about half to two-thirds of the total incomes in agricultural households. Agricultural households comprised 76 percent of rural households in the Uva province, 83 percent in the North Central province, 53 percent in the Northern and Eastern provinces, and 50 percent in the Sabaragamuwa province and the income from agriculture accounted to 59 percent in the Uva province, 67 percent in the Northern and Eastern provinces, 60 percent in the Sabaragamuwa province (World Bank 1996).

The structural vulnerability that has been created by geographical isolation due to limited access to markets, infrastructure, and lower endowment of human capital and so on has inhibited livelihood opportunities to the people in the peripheries. Particularly, moving away from the main urban service oriented sectors, people are gradually sacrificing their opportunities for better living and hence the most available livelihood becomes natural resource base. Agriculture, fishing and related wage labouring are the principle livelihoods of such population.

Therefore, rural poverty is attributed to low levels of agricultural productivity and income due primarily to limited infrastructure and basic services in such areas that inhibit access to rural areas and market linkages. Rural industrialisation has hardly taken place to absorb the unemployed and resource poor labour force in the peripheries. Agricultural productivity grew marginally that the rural income could not assure of the basic well-being of the rural people. In most instances, the land holding size/farm size is very small and the production capacity of these farmers are very small. In such situations, the scale of production is too small to produce at commercial level and their bargaining power over their produce for better prices is very limited. These rural communities have also very little capital to invest in and their knowledge of new technologies is limited. Therefore, low levels of technology adoption and modern management practices; lack of diversification to higher value marketable agricultural products is commonly observed. At low productivity levels, the quality of the produce is poor and is not up to market standard for a better price. Hence, they continue to remain in the vicious cycle of poverty.

Economic growth is the only means available to bring the poor out of the country's extreme poverty. However, the regional imbalance of the growth is/should be a prime concern of the government in implementing the development programmes. The base or the building block for such a growth strategy begins with the natural resources, as rural poor depend on land, forest and water for their livelihood. These resources need to be well managed in a sustainable way and with a long-term vision which will provide the basis for broad economic development and poverty reduction across regions.

Given the large proportion of the poorer households dependent on agriculture, and the large contribution farming activities make their aggregate income, the removal of obstacles to raising agricultural productivity and income can also be an important contributor to poverty reduction, as a complement to increasing job opportunities in manufacturing and services. Therefore, conducive agricultural growth and investment policies are vital to raise agricultural productivity in these geographical areas that could eventually contribute to raising income and reducing poverty in these areas. Sustainable utilisation of natural resources, better management of water resources and improving public sector research and

extension services also impact largely on livelihood security of such communities. However, it is vital to improve the access to basic infrastructure and services in rural areas that enables to expand the rural growth. Rural development, agricultural production, food insecurity and poverty are closely linked to each other that it is necessary to address these components in a holistic approach.

Conclusion

Malnutrition indicators across the country signify the geographical variation of the food insecurity and vulnerability situation in Sri Lanka. In addressing the problem, different dimensions of food insecurity and vulnerability are increasingly important to understand the causal factors hindering adequate food and nutrient intake in different geographical areas.

The food availability dimension receives/has received the attention at all times in terms of national food security. The achievement in the food production sector is vast –however, the growth of the food production sector has not been on par with the population growth, income growth and with the change in the population structure compared to the neighbouring countries. Moreover, the importance of sub-national food economies in Sri Lanka could not be underrated although an open market system has been in operation since late 1970s. Being the food consumption patterns of different regions primarily oriented on regional production and moving away from a central market system to a more regionalised market due to increased transaction cost added to the transport cost, the degree of regional food self-sufficiency becomes an increasingly important aspect to increase access to food within the region. Targeting food production programmes for food self-sufficiency in the region is important to reduce food price that increases the affordability of the poorer.

Poor infrastructure and lack of basic facilities and the economic growth paradigm hampered the growth potential of rural peripheries resulting from the more urban biased growth, regional disparity and rural poverty in Sri Lanka. As moving away from urban centres takes place, the livelihood opportunities people have, become lesser and lesser. This structural vulnerability caused people to struggle with natural resources for their living. Agriculture, fishing and related wage labouring are the principle livelihoods of such population. Understanding the large proportion of the poorer households dependent on agriculture and the large contribution farming activities make their aggregate income, the removal of obstacles to raising agricultural productivity and income help poorer taking out from the vicious poverty cycle. Rural development, agricultural production, food insecurity and poverty are closely linked to each other that any rural development strategy should take into account this spatial variation and its intensity to ensure food and nutrition security of the people concerned.

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