

REALIZING SUSTAINABLE FOOD SECURITY IN THE POST-2015 DEVELOPMENT ERA: SOUTH ASIA'S PROGRESS, CHALLENGES AND OPPORTUNITIES

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Foreword

The Development Papers Series of the ESCAP South and South-West Asia Office (ESCAP-SSWA) promotes and disseminates policy-relevant research on the development challenges facing South and South-West Asia. It features policy research conducted at ESCAP-SSWA as well as by outside experts from within the region and beyond. The objective is to foster an informed debate on development policy challenges facing the subregion and sharing of development experiences and best practices.

This particular paper reviews South Asia's progress, challenges and opportunities for realizing sustainable food security and argues that greater efforts are urgently required at the regional level to coordinate policy responses, given the trans-boundary implications of food production systems, distribution and trade that have serious implications for food security. Taking stock of progress accomplished over the last 25 years in the subregion, the paper notes that in spite of impressive progress, the rate of decline of chronic undernourishment is too slow to completely eliminate chronic undernourishment, even by 2050. It concludes with outlining the policy priorities and opportunities for achieving sustainable food security in South Asia in post-2015 period.

We hope that this paper will offer a useful contribution to the ongoing debate on the means to tackle the alarming challenge of food security in South Asia and on ways to enhance regional cooperation to address this fundamental issue.

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Realizing sustainable food security in the post-2015 development era: South Asia's progress, challenges and opportunities

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Abstract

South Asia has made tremendous progress toward alleviating hunger and food insecurity during the last quarter century. Notwithstanding this impressive progress, the rate of decline of chronic undernourishment is too low to completely eliminate chronic undernourishment even by 2050. This paper reviews South Asia's progress, challenges and opportunities for realizing sustainable food security in the post-2015 development agenda. The review finds that South Asia's average dietary energy supply is inadequate to reduce the Prevalence of Undernourishment (PoU) to 5% level, which can be considered as the lowest attainable level for a country. The current level of undernourishment in each country is determined by a diverse set of factors including related to domestic supply and how food is utilised.

These differences appear to have been well recognized in national food and nutrition security policies, but the extent to which these policies have yielded desired results is not clear. Much more effort at evaluating their efforts is needed. There is a strong case for much greater effort at the regional level for coordinating policy responses given the trans-boundary implications of food production systems, distribution and trade with huge implications for food security. The region can do much more to improve agricultural productivity and production, enhance agricultural R&D, disseminate and share knowledge; managing agro-ecological zones including large river-basin systems; managing food security risks and vulnerability; and share knowledge on implementing safety nets.

There is greater scope for better coordinating national and regional efforts on food security within the post-2015 development agenda in alignment with the Zero Hunger Challenge. The current practice of using the rate of PoU as the basis for food security planning limits the scope of such efforts to chronically undernourished people. The post-2015 development agenda needs to cover all forms of malnutrition, both undernourishment and overweight, and their underlying sources including food requirements to meet different physical activity levels and transitory food insecurity, all within a framework of sustainable development and structural transformation in agriculture. Food security planning processes need to be inclusive and must be informed by local knowledge, community aspirations, and feasible dispute settlement mechanisms.

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1. Introduction

The global community is on the verge of identifying a new development framework to replace the Millennium Development Goals (MDGs), which will expire in 2015. Under MDGs, Halving, between 1990 and 2015, the proportion of people who suffer from hunger was one of the three targets under Goal 1 that called for ending poverty and hunger². During the Rio+20 summit, the United Nations Secretary General pointed out that, despite bold steps taken by the world community, the world still has close to one billion hungry people, and called for governments, businesses, farmers, scientists, civil society and consumers to work together to achieve ‘Zero Hunger’ (United Nations, 2012). The Zero Hunger Challenge called for eliminating all forms of hunger, develop inclusive and sustainable food systems, and eliminate food waste.

The adoption of the Millennium Declaration by the UN General Assembly on 18 September 2000 (United Nations, 2000), and the subsequent identification of the MDGs, was a milestone in history. The MDG framework re-shaped the discourse on development and poverty, and established that the primary objective of economic development is for eliminating poverty, food insecurity and other deprivations that affected millions of people at the turn of the century. The world has made progress on all fronts as the recent MDG global and regional reports have demonstrated (United Nations, 2014; United Nations, 2013), but much progress is yet to be made on several fronts. Food security is one area. This paper focuses on identifying South Asia’s progress in food security in the last quarter century; constraints that prevented the region from achieving the targets established; and opportunities for realizing sustainable food security during the post-2015 era.

The rest of the paper is organised as follows. Section 2 reviews South Asia’s achievements in food security since holding the 1992 World Food Summit. Section 3 analyses the causes of food insecurity. Section 4 discusses national food security policies, strategies and programmes, along with the common themes that may best be approached from a regional perspective. Section 5 identifies opportunities for realizing food security in the post-2015 development agenda.

2. South Asia’s achievements in food security

South Asia³ has made tremendous progress towards eliminating chronic undernourishment since holding the 1992 World Food Summit. These achievements are summarized below.

2 Two indicators officially identified for measuring the Target 1.C were Prevalence of underweight children under-five years of age and Proportion of population below minimum level of dietary energy consumption (United Nations, 2000).

3 The term South Asia in this paper is defined to include the eight countries that are also part of the South Asian Association for Regional Cooperation: Afghanistan, Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan and Sri Lanka. Data limitations prevented Afghanistan being included in much of the analysis. Nevertheless, the term South Asia is used throughout the paper to describe food security situation of the region.

Chronic undernourishment⁴

At the time of holding the 1992 World Food Summit, South Asia was estimated to have 314 million chronically undernourished people (FAO, 2013). By 2011-13, however, this has reduced to 294.7 million. The prevalence of undernourishment (PoU), that is undernourished people as a proportion of the total population, declined from 27% in 1990-92 to 17.5%⁵ in 2011-13 (Figure 1)

Although the number of undernourished people has declined only by 19.3 million in absolute terms from 1990-92 to 2011-13, the number of people who would have potentially been affected by undernourishment is much larger because population during the same period grew from 1,166.7 million to 1,677.4 ml, or by 510 million. To get a sense of the potential number of undernourished people in absence of a reduction of food insecurity, consider the extreme case where PoU did not decline but remained at the same level as in 1990-92. This would imply that South Asia would have 451.9 million undernourished people in 2011-13, instead of 294.7 million. Thus, South Asia has effectively brought down the number of chronically undernourished people by 157 million. This is an impressive achievement.

Regional progress and failures also hide significant country variations. For example, during 1990-92 to 2011-13, PoU in Bangladesh has come down by 1.7% annually⁶, whereas in Sri Lanka, India and Pakistan, it has come down only by 0.9%, 0.28%, 0.03%, respectively. Nepal did not record any decline during the period. Bangladesh recorded the largest reduction of PoU in comparison to their respective populations. A worrying fact is the apparent mismatch between GDP growth rates and reduction of food insecurity. During the same period as discussed above, the compound rate of growth of GDP per capita grew by 3.6, 4.5, 2.4, 1.8, and 4.4 in Bangladesh, India, Nepal, Pakistan and Sri Lanka, respectively. These impressive growth rates appear to have made little impact on the reduction of food insecurity.

The slow decline of undernourishment is evident when the number of undernourished as well as the proportion of undernourished in South Asia is juxtaposed with the levels of other regions (Figure 2). The south Asian region continues to hold the largest number of undernourished people in the world; and in terms of the prevalence undernourishment, the region is just above that of Sub-Saharan Africa.

⁴ The Prevalence of Undernourishment expresses the probability that a randomly selected individual from the population consumes an amount of calories that is insufficient to cover her/his energy requirement for an active and healthy life. The indicator is computed by comparing a probability distribution of habitual daily Dietary Energy Consumption with a threshold level called the Minimum Dietary Energy Requirement. Both are based on the notion of an average individual in the reference population. This is the traditional FAO hunger indicator, adopted as official Millennium Development Goal indicator for Goal 1, Target 1.9

⁵ This figure is slightly higher than the figure given by FAO in the State of Food Insecurity in the World report 2013 because the latter includes Iran (Islamic Republic of) as well. FAO considers Iran as part of South Asia in all its estimates.

⁶ This refers to the compound rate of growth, defined as $g = \sqrt[n]{T_n/T_0} - 1$, where T_n and T_0 refer to the number of undernourished people in 2011-13 and 1990-92, respectively, and n is the number of years during the period.

Undernourishment in 2050

What would be the level of undernourishment in 2050 if the current rate of decline continues? If PoU declines at the current rate, the five countries will still have 251 million undernourished people by 2050, distributed across the countries as follows: Bangladesh 22 million (PoU of 11%), India 191 million (12%), Nepal 4.5 million (12%), Pakistan 28 million (10.3%) and Sri Lanka 4.3 million (18%). PoU in Bangladesh, India, Nepal and Pakistan is likely to converge to 10-12%, and Sri Lanka to 18%, under the business-as-usual scenario⁷ (Figure 2). This shows that the current rate of decline of undernourishment is inadequate for eliminating hunger from South Asia even by 2050.

Food requirements for lifting the undernourished

How much calories would be required to lift the currently undernourished people out of their food insecurity? The Depth of Food Deficit (DoFD)⁸ is a measure designed to capture the amount of calories per day per person needed to lift the undernourished people from their current level of food insecurity. For Bangladesh, India, Nepal and Pakistan, estimated calorie requirements are in the range of 112 kcal to 131 Kcal, and in Sri Lanka 200 kcal, per person per day (Figure 3). This could be achieved through: increased production, introducing a better food and income redistribution policy, reducing waste throughout the food value chain, or through imports. How much food is this in aggregate terms? Back-of-the envelope calculations indicate that South Asia needs approximately 9 million metric tons of food to be made available for the consumption of the chronically undernourished people.⁹ This is not an unachievable target, especially given that it is a fraction of food being produced. To put this in perspective, Sri Lanka, the country with the highest food deficit, would need approximately 200,000 metric tons of food per year to be made available to the chronically undernourished people. This is not an unachievable target, given that it is only 4% of the current cereal production. Achieving the target will require mustering political will, and implementing an efficient food delivery system to ensure food reaches the needy.

Towards realizing the Zero Hunger Challenge

The focus of food security has shifted from mere elimination of chronic food deprivation to the Zero Hunger Challenge, which called for stakeholders to act to ensure everyone has access to enough nutritious food all year round; and no more malnutrition in pregnancy and early childhood, and

⁷ Population projections used for the estimates are from the United Nations population projections. According to these estimates, the combined population of Bangladesh, India, Nepal, Pakistan and Sri Lanka will be 2.15 billion in 2050.

⁸ The depth of the food deficit indicates how many calories would be needed to lift the undernourished from their status, everything else being constant. The average intensity of food deprivation of the undernourished, estimated as the difference between the average dietary energy requirement and the average dietary energy consumption of the undernourished population (food-deprived), is multiplied by the number of undernourished to provide an estimate of the total food deficit in the country, which is then normalized by the total population (FAO, 2013)

⁹ This is calculated by multiplying the food deficit in kcal per capita per day, by the population of the country and 365 (no of days per year), adjusted by the conversion factor 0.00012959782, which indicates the amount of food in kilograms needed to produce one kcal. The total figure was then divided by 1000 to convert it into metric tons.

an end to childhood stunting¹⁰ (United Nations, 2012). To realize the goals of the Zero Hunger Challenge, three things must be realized, as discussed below.

Ensuring everyone has access to food

Ensuring everyone has access to food all year round will require the adoption of a broad definition for several reasons. This will allow considerations to be given to those who may be at risk of not having adequate access to food to meet their level of physical activity, as it is in the case of PoU, which estimates only the chronically undernourished people. This will also offer an opportunity to accommodate the expectations of people for higher standard of living, including better access to more and nutritious food as that happens with economic growth. This is also mandated by new legislation such as the Food Security Ordinance of India, 2013.

The Prevalence of Food Inadequacy (PoFI)¹¹ is a measure for identifying the level of undernourishment also covering people with higher physical activity levels. With this new measure, the proportion of undernourished people increases across all the South Asian countries (Figure 4). The new measure would indicate that 30% of people in Sri Lanka; a quarter of the population in Bangladesh, India, Nepal and Pakistan; and 20% in the Maldives suffer from food inadequacy. Eliminating food insecurity inclusive of this group will require much bigger commitment.

Ensuring everyone has access to food all year round

The Zero Hunger Challenge also called for ensuring food security all year round. Variation of food consumption within a year has been well recognised as a critical issue among the poor people, especially those who rely on daily wage earnings or seasonal agriculture. Aggregate data on food production and consumption often obscure seasonal variation of food production and consumption in any given year (Sahn, 1989).

In India, while seasonal variation of rainfall, production and consumption over different regions is large, the enormity of the Indian economy greatly dampens the incidence of covariate risk of production and consumption (Walker and Ryan, 1990). Based on the ICRISAT VLS (International

¹⁰ The zero hunger challenge also requests countries to ensure that the food systems everywhere are sustainable and greater opportunity for smallholder farmers raise their productivity and income; and cut losses throughout the food value chain. These measures are likely to contribute to ensure the sustainability of food systems.

¹¹ The generally reported measure of undernourishment focuses on estimating number and proportion of the chronically undernourished people. The methodology is designed to get an estimate that is comparable across countries, with the most commonly available data. It aims to avoid overestimation of the undernourished population. The dietary energy requirement (MDER) coefficient is critical for this estimation. This depends on physical activity levels (PAL). FAO calculations use the MDER coefficient of 1.55, which corresponds to a sedentary lifestyle. While this avoids the possibility for the undernourished group to include well-nourished people, it opens up for the possibility to ignore people who may be at risk of not having adequate access to food to meet their level of physical activity. To provide a measure that may also include this group, FAO estimates the Prevalence of Food Inadequacy (POFI) by setting the Physical Activity Level (PAL) coefficient to 175 rather than 155. Hence, by definition, they cannot be considered chronically undernourished, but are likely to have been affected by insufficient food. The new measure estimates the percentage of the population at risk of not covering the food requirements associated with normal physical activity and THE chronically undernourished PEOPLE. Refer to FAO (2013) for a full description of the methodology.

Crops Research Institute for the Semi-Arid tropics Village Level Studies) data set, Behrman and Deolalikar (1989) showed that there is a seasonal shift in food, especially proteins, consumed by households in semi-arid tropical regions in Southern India. The study further points out that paying attention to the lean season is important for nutritional security because vulnerable children are likely to be particularly exposed to malnutrition risk when food is scarcest. Seasonal variation of food consumption is further confirmed by village level studies including Pinstруп-Anderson and Jaramilo (1989) on North Arcot, India. Co-variation of production and consumption can also be observed among farming communities in North-Central parts of Sri Lanka; and households employ a myriad of coping mechanisms to smoothing out consumption with limited success in the presence of high transaction costs (Wickramasinghe, 1995 and 1997). In Bangladesh, this is known as *monga*, which refers to seasonal deprivation of food during the pre-harvest season of Aman rice, and affects mostly the farmers and labourers in the northwest region due to lack of employment opportunities during the months of September to November. This significantly increases households vulnerability to food shortages (Khandker, 2009; Salahuddin, et.al. 2009). Based on household income and consumption data, Khandker (ibid) shows that average household income and consumption are much lower during 'monga' season than in other seasons, and that seasonal income greatly influences seasonal consumption. It also finds that lack of income and consumption smoothing is more acute in greater Rangpur, the North West region, than in other regions, causing widespread seasonal food deprivation.

These studies show that several factors are responsible for the observed phenomenon: intra-household food distribution; the nature of household preferences; the ability of the household to obtain food seasonally, as conditioned by the patterns of earnings, prices, and savings; the timing of production, trade and food stock withdrawals; and food storage and processing.

Child malnutrition

Nutritional levels and growth among children provide invaluable information on the nutritional status of a community or a population. It also indicates the future potential of the workforce, as children who suffer from growth retardation due to poor diets or recurrent infections tend to have a greater risk of developing chronic health problems, impaired cognition capacities in extreme cases, and impeded work productivity. Poor nutrition among children weakens the immune system, increasing disease incidence and severity (Tomkins and Watson, 1989). Ensuring better nutrition makes sense not just because it is the right thing to do, but an economic necessity to ensure productive capacity of labour force in the future.

According to two of the most commonly used three indicators on malnutrition among children aged 5 years or lower –wasting, underweight and stunting¹²- South Asian countries have high child malnutrition. South Asia¹³ as a group had the highest prevalence of underweight children in 2012, 30% of children moderately or severely underweight, but also experienced the largest, absolute decline

¹² Percentage of children between 0-5 years as a percentage of children in the same age group is measured under each of the three measures taking into account those less than -2 standard deviation of the WHO child growth standards median): Wasting (weight-for-height); Stunting (weight-for-age); Underweight (weight-for-age).

¹³ Following the FAO geographic grouping system, this value includes Iran (Islamic Republic of) as part of South Asia.

since 1990 (United Nations, 2014). As Figure 5 shows for the latest year which data are available, stunting is above 40% in Bangladesh, India and Pakistan. Underweight among children is above 40% in India and Bangladesh; it is close to 30% in Nepal and Pakistan; and around 20% in the Maldives and Sri Lanka. In Bhutan, indicators suggest a mixed picture. The measures on underweight and wasting indicate a lower level of child malnutrition, but stunting is relatively high. Malnutrition is highly correlated with the level of household income. In South Asia, 60% of children in the poorest quintile are underweight, compared with 26% of those in the richest quintile (United Nations, 2011). Notwithstanding the nuances that should be taken into account in interpreting the data, it is evident that a significant proportion of children in South Asia continue to suffer from severe forms of malnutrition.

Malnutrition in pregnancy

Improving maternal nutrition before, during and immediately after pregnancy is a proven intervention to reduce child malnutrition (United Nations, 2014). Yet, malnutrition in pregnancy is a serious issue in South Asia. The prevalence of anaemia during pregnancy, for example, varies from 29.3% in 2005 in Sri Lanka to 61% in Afghanistan in 2001 (Figure 6). The data cannot be easily compared across countries due to limited availability of data, but inferences can be made on possible progress that may have been made since the year for which latest data are available. Such an inference would indicate a bleak situation, and hence a considerable effort will be needed for improving malnutrition in pregnancy. That should also include a much bigger commitment to collection reliable information.

Overweight

In 2011, overweight affected 7% of preschool children (43 million) worldwide (WHO, 2013), and the rate of increase over the past 20 years has been similar in developed and developing countries, whereas some regions have experienced drastic increases (WHO, 2013). Although South Asia has not yet caught up with other regions on overweight and obesity as can be observed from the global data available from the WHO report mentioned above, people, especially women, in high socio-economic status in South Asia are likely to be affected by overweight and obesity (Griffiths and Bentley, 2005).

3. Causes of food insecurity

What factors would explain high undernourishment in South Asia? Food insecurity is generally characterised by four dimensions: food availability, food accessibility, vulnerability and absorption. Food availability and food accessibility are related to supply and demand for food. Food availability is determined by local production, the amount of food stored and withdrawn from previous stocks, food imports and exports, food waste, and the amount of food used as seeds. Food accessibility is generally considered within the context of household income and food distribution systems. In addition, food security is also influenced by household income, food preferences, cooking technology, food distribution systems and total population.

Average dietary energy supply adequacy

The FAO methodology of estimating the measure known as the Average Dietary Energy Supply Adequacy by combines food demand and supply side factors. Rather than relying on actual food demand, FAO relies on estimating physical food requirement of a country by estimating calorie requirements of the population to meet biological food energy requirements, which is conditioned by age, sex and level of physical activity. This is known as the average dietary energy requirement (ADER)¹. Domestic food supply on the other hand is estimated by adding local production, imports and changes in food stocks and subtracting exports.¹⁴ This is equivalent to Dietary Energy Supply (DES). The ratio between DES and ADER gives the Average Dietary Energy Supply Adequacy (ADESA) ratio. This provides an estimate the adequacy of food supply to meet a nation's biological food requirements.

Is there a threshold of ADESA ratio that a country must reach before the country can reduce its own PoU to the natural rate of undernourishment? To see if an empirical regularity exists, a scatterplot between ADESA and PoU across the world was drawn. Figure 7 provides the scatterplot. The correlation between the two measurements is -0.8. It can be observed that countries that have reached 5% PoU invariably have ADESA rates above 115 at minimum, but the average value is 120%. There are exceptions, however. Five countries, namely Moldova, Cyprus, Bulgaria, Japan and Slovakia) have reached 5% PoU without reaching ADESA of 115%. On the other hand, there are four countries (Guinea, Guinea-Bissau, Cote d'Ivoire and China) that have exceeded ADESA of 120%, but PoU has not declined. As FAO has indicated, ADESA and PoU in combination indicate whether food insecurity is primarily due to inadequate food supply or other factors such as weaknesses in the food distribution systems. If for example, ADESA is high but there is high PoU, it can be due to high-income inequality, weak food distribution system or difficulties in accessibility. Low ADESA with low PoU may indicate the existence of high public safety net programmes or extremely low food losses, low-income inequality and efficient distribution systems.

The Maldives has reached ADESA of above 120 with PoU of 5%. Pakistan is located slightly above the minimum threshold of 115%; and all other countries in South Asia are below the minimum threshold. Thus, the current levels of dietary energy supply will not allow the region to naturally reach the 5% natural undernourishment level. It can be observed from Figure 8 that ADESA ratio has risen across all the South Asian countries. Bangladesh has shown the most dramatic gains, but growth has been petered since the turn of the century with a small decline in most recent years.

To identify the most probable causes for food insecurity in South Asia, this result needs to be viewed together with domestic food supply and its utilisation. As shown above, domestic supply consists of local production adjusted for imports, exports and stock changes. Domestic food is utilised in several ways: for human consumption, as seeds, as inputs in industrial processing, food waste and as animal feed. Tables 1 and 2 provide commodity level information on domestic food supply and utilisation in five countries in South Asia.

In Bangladesh, local production as a percentage of total supply is close to or above 100% in several food commodities including cereal, sugar, meat, offal, eggs and fish. Imports do not figure high in major commodity groups; and food exports are limited to a handful of commodities. On food

¹⁴ Food balance can be represented as follows: local production + imports – exports + stock change = domestic supply = human consumption + animal feed + manufacturing processes + seed + waste.

utilisation, over 80% of domestic food supply is used for human consumption; usage for industrial processing is limited to sugar and oil-crops; and wastage of food is relatively high in cereals (6%), but wastage in commodities such as starchy roots, fruits and vegetables stands at 10%.

India's local food production exceeds 100% of domestic supply in almost all commodity groups by a significant margin. Only exceptions are tree-nuts and vegetable oils. Correspondingly, imports as a percentage of total domestic supply is either zero or close to zero in many commodity groups, with exceptions of tree-nuts, vegetable oils and stimulants. Much of food is used for human consumption; and only two commodities -sugar and oil crops- are processed. Food wastage is observed to be significantly high in starchy roots and fruits. The high food production and high PoU imply a greater impact of issues related to food accessibility as a key source of food insecurity.

Local production as a percentage of total supply in Nepal is high across a number of commodities including cereals, starchy roots, sugar, meat, offal, eggs and milk. In case of cereals, only 72% of food is used for human consumption – the lowest in South Asia. Almost 15% is used as feed and 11% is estimated to go waste. Food waste is relatively high across several other commodities too including starchy roots (14%), sugar (10%), and vegetables (10%). Nepal imports a significant proportion of food across all commodity groups, with the exceptions of sugar, meat, offal and eggs. Improving food security will require efforts towards reducing food waste, increasing agricultural productivity, introduction of an efficient system of food distribution, and income generation activities.

In Pakistan, local production as a percentage of total food supply is relatively high across several commodities, especially cereals, starchy roots, vegetables, fruits, meat, and fish. Imports are limited to those with inadequate local production, namely pulses, tree-nuts, oil-crops, vegetable oils and spices. Food waste is relatively low, except for starchy roots, eggs and milk, each with 10% wastage. It appears that accessibility and food distribution are the main potential reasons for the high levels of undernourishment in Pakistan.

In Sri Lanka, local food production as a percentage of domestic supply in cereals is only 78% - the lowest among the five countries considered. The same is applicable to all major commodity groups. This has resulted in high import dependency on cereals (42%), starchy roots (42%), pulses (96%), vegetable oils (75%), vegetables (22%), spices (61%), milk (76%) and fish (31%). Wastage in vegetables and fruits currently stands at around 10%. It appears that high PoU is a result of both supply and demand side constraints including poor accessibility.

In summary, the current level of dietary energy supply at the household level in South Asia is inadequate to meet food requirements for all to have adequate access to food. This is a result of many underlying factors including the food production systems, stock management policies, food waste, food trade and food industry. Designing food security policies will need to identify the most significant factor responsible for the inadequate dietary energy supply at the county level. Further research, including through analysis using household level data, will be required in identifying exact reasons.

Poverty

Income poverty and other multidimensional aspects of poverty such as lack of access to clean energy, water and sanitation are often considered as factors for high incidence of undernourishment.

Low income leads to inadequate access to food; malnutrition perpetuates poverty through low productivity of current and future generations, and hence even contributing to inter-generational transfer of poverty. Poverty headcount at \$ 1.25 a day has declined across South Asia (Figure 9). It can be observed that the decline in headcount poverty is negatively correlated with PoU, which is also influenced by dietary energy supply, income re-distribution and safety nets.

Share of food expenditure among low-income people is another useful indicator. The Engle's law predicts that the share of food expenditure is high among the poorer segments of population. In South Asia, the share of food in total expenditure is very high among poorer population groups. This share is as high as 75% in Pakistan and Nepal 71%, and all others above 60% (Figure 10). With such high shares of food expenditures, households can afford to purchase only basic food and essential consumption items.

Seasonal variation of income is another factor. Empirical evidence suggests that food consumption in rural areas has a high seasonal variation due to seasonal nature of income streams, especially among rural farm households. In general, rural farm households also have very little savings and disposable assets. In this environment, even a small drop in household income is observed to trigger households to reduce their food intake, generally starting with food items that are relatively expensive such as meat, eggs, milk and vegetables (Jodha, 1978). Income shocks arising from a crop failure due to a prolonged drought or a pest attack can significantly reduce food consumption. Income shocks over two or more periods (e.g., an additional month in case of daily wage earners or into second crop season in case of farmers) can devastate farm households, and push them into deeper crisis of food insecurity (Jodha, 1978; Deaton, 1993; and Wickramasinghe, 1995). Safety net programmes often help households to avoid such transitory food insecurity episodes and save vulnerable groups from falling into malnutrition traps.

4. Food security strategies, approaches and programs

Ensuring food security has been a key focus of South Asian countries in development planning and strategies. This section reviews food and nutrition security policies, strategies and programmes that are currently in operation across South Asia. The objective is to identify policy priorities and outline priorities for regional interventions.

Review of national policies for food security

Bangladesh

The National Food Policy Plan of Action 2008-2015 (PoA-2008) developed by the Food Planning and Monitoring Unit (FPMU) of the Ministry of Food and Disaster Management (MFDM) is the current plan of action on food security (GoB, 2008). PoA-2008 has three objectives, each with supporting policies. The three objectives are: (A) adequate and stable supply of safe and nutritious food; (B) increased purchasing power and access to food; and (C) adequate nutrition for all individuals, especially women and children.

Objective A is supported by four interventions: increasing production, managing food stocks, strengthening market linkages, and managing vulnerability. Each intervention is supported by several actions. Proposed actions for increasing food production include: development and dissemination of

crop and non-crop technologies, irrigation; and increase the supply of quality seed, high value crops, fish and livestock products. Managing food stocks is attempted through private and public sector programme. For managing vulnerability, increasing farmer access to credit, establishing a domestic early-warning system, and stabilizing farmers' income through producer price support have been proposed.

Interventions for realizing objective B include: managing vulnerability to disasters, improving access to food during lean periods, enhancing market participation of women and disable people, and supporting expansion of agro-based processing and quality of technical and vocational education. Objective C is supported through increasing the availability of balanced and nutritious food for vulnerable people and food fortification; enhanced long-term nutritional planning, nutrition education, food safety and quality, access to safe water and sanitation; and promoting breastfeeding and better service provision (e.g., maternity leave).

Bangladesh has also implemented a variety of social safety net programmes with the objective of enhancing access to food among vulnerable people and communities. These programmes are offered through several government ministries or departments such as the Department of Social Services, Department of Women's Affairs and government projects. Rahman et al. (2011) classified safety nets as: allowances and unconditional transfers, food security and disaster assistance, employment / workforce related; human development / social empowerment, and subsidies. Safety net programmes targeting food security include Vulnerable Group Feeding (VGF), Test Relief (TR) Food, Vulnerable Group Development (VGD), Open Market Sales (OMS), Gratuitous Relief (GR) – Food, Food Assistance in Chittagong Hill Tracts Area, and Food For Work (FFW). As estimated by Rahman et al. (ibid), outlay for social safety nets stands at over 1.6 billion USD. They have contributed to consumption smoothening of poor households in the face of risks and shocks, supplement household incomes, and enhance human capital and access to basic services, but Bangladesh has followed “an experimental approach to building its safety net portfolio with significant trial and error in programmes driven by many actors” (Rahman, ibid, p. 51).

Food policy Working group consisting of 13 ministries or divisions were identified for implementing the PoA-2008.

Bhutan

The Government of Bhutan adopted the Food and Nutrition Security Policy of the Kingdom of Bhutan 2014 (FNSP-2014) as its official policy governing food and nutrition security in 2014, and Ministry of Agriculture and Forests (MoAF) will lead the implementation with support of the Ministry of Health (MoH) (GoBH, 2014).

FNSP-2014 aims to realize for goals: (1) ensure availability of safe and adequate varieties of food to meet food requirements; (2) enhance physical, economic and social access to safe, affordable and adequate food; (3) promote appropriate consumption practices and enable optimum utilization of food by all; and (4) sustain conducive and stable environment for availability, accessibility and utilization of food.

The framework covers all key dimensions of food security. Key policies include measures to increase domestic production; enhancing the distribution of imported food through markets;

maintaining a national food security reserve under the Food Corporation of Bhutan (FCB) comprising of rice, oil and sugar; and the promotion of commercial market and FCB distribution system. For enhancing accessibility, it proposed the promotion of income generating activities; and program support for fruit crops, vegetables and livestock production. FNSP-2014 recognised the non-availability of a national safety net program, but recognised the role played by traditional social safety networks in ensuring food security. The need to manage rising food prices and significant regional variation of calorie intake; low consumption of protein, vitamins and minerals; and managing natural disasters (frequent and intense extreme weather events), which affect farm incomes were among other policies proposed for enhancing nutritional security.

India

The National Food Security Ordinance 2013 (NFSO-2013) provides the legal foundation for ensuring good security for people in India (GoI, 2013). Key provisions of the NFSO-2013 include: (i) entitlement to receive five kilograms of food-grains per person per month on subsidized prices; (ii) school feeding program; and (iii) a food security allowance to persons in case of non-supply of food-grains or meals to entitled persons. As for the system of administration, the NFSO-2014 proposed (i) mechanisms to develop a system to identify eligible households; (ii) reforms in the targeted public distribution system; (iii) women empowerment through the distribution of ration cards to eldest woman above 18 years of age of the household; (iv) grievance redressal system; and (v) obligations of state government. Additional schedules of the ordinance identified further provisions including subsidized prices under the targeted distribution system; nutrition standards; provisions for advancing food security through such activities as revitalization of agriculture, procurement and storage, and access to safe and adequate water, sanitation, health care and nutritional education.

Joshi (2013)¹⁵ identified three key challenges in implementing the bill: (i) identification of the poor and ensure that subsidized food reaches the real needy, poor and undernourished; (ii) huge subsidy burden at the cost of investment for generating employment through other developmental activities; and (iii) sustainability of the scheme in a scenario of changing food basket and climate change.

In India, public safety net programmes have been in existence since 1951, offered by both the central government and state governments. Desai, et al. (2010) identified six types of public safety net programmes that existed in 2005. They included: Public Distribution System (started in the 1960s, and modified and supplemented by *Antyodaya* in 2001); school assistance (free books and uniforms); Midday Meal (MDM) programme; Integrated Child Development Services (ICDS) (since the mid-1970s); Food for Work Programme (started in 2000); and Programmes for elderly (NOAP) and Widow Pension, and Annapurna. The review of Desai et al. (ibid) concluded that: (a) programmes that have existed for a long time have extended outreach; (b) while programmes have attempted to introduce targeting, complexity of Indian inequality across class, caste, community and regional lines have made it difficult for implementation, and hence often programmes with self targeting or neutrality have become politically attractive.

¹⁵ Joshi (2013) and IFPRI (2013) provide an excellent review, analysis and constraints to implementing of the bill.

Maldives

Agricultural Development Master Plan 2006-2020 (ADMP-2006) continues to provide the policy framework for food policy and agricultural development in the Maldives (GoRM, 2006). ADMP-2006 aimed at improving food security, nutrition and income among others through gradual commercialization of agriculture, raising productivity of land, labour, water and human resources. ADMP-2006 proposed six elements: (i) promotion of garden farming for household consumption; (ii) commercialization of agriculture by linking farmers with resorts; (iii) leasing out selected islands for farming on commercial basis; (iv) promotion of value addition for generating higher employment and income; (v) adoption of sustainable technological options; and (vi) ensure a regional balance of agricultural development and gender equity.

A FAO led review of agriculture in Maldives identified that the development of the sector is constrained by a host of factors including high cost and low return to agricultural investment as a key constraint in attracting the private sector to invest in agriculture. This is primarily due to small amount of land available, poor soil quality, and lack of access to sufficient water. Difficulties in navigating the waters during the monsoon seasons, especially during January to March and July to October, and with the currently available relatively smaller boats, exacerbate food insecurity in outer islands. The government-owned food corporation maintains food storages in strategic locations to ensure food is available for inhabitants of remote locations.

Nepal

In Nepal, food policy is governed under the Nepal Agriculture and Food Security Country Investment Plan (AFSP-2010) (GoN, 2010). This is a comprehensive plan, aligned with country's needs and government priorities, and it addresses key constraints and development challenges facing Nepal in the area of agriculture and food security. The areas covered include: agricultural productivity, limited livelihoods opportunities, inefficient food distribution system, weak market linkages, poor infrastructure and lack of awareness of the general public on good food habits. Enhancing food security of vulnerable populations and livelihood opportunities; reducing food and health risks among vulnerable populations and improving income earning employment opportunities for targeted communities; and contributing to enhance nutrition security through the promotion of diversified diets, increased nutrient intake, improved feeding habits and caring of pregnant and nursing women are the main objectives.

The plan envisaged using multiple tools for achieving these objectives. They include: development and adoption of technology for livestock and crops sectors; making available of high quality seeds to farmers on continuous basis; enhancing agricultural productivity; and direct and targeted interventions to enhance food and nutrient intake by vulnerable populations. The Global Agriculture and Food Security Program (GAFSP) awarded a grant of \$46.5 million in 2011 to implement activities to enhance food security.

Pakistan

Pakistan never had a national food policy except some regional level programs launched by the government (Mittal and Sethi, 2009). One such programme is the Special Program for Food Security (SPFS), implemented with the support from FAO (Ahmad and Farooq, 2010). This was subsequently scaled up and covered 100 villages under the Crop Maximisation Program (CMP-I),

which was further expanded to cover over 1000 villages under CMP-II. Professionals and stakeholders, however, questioned its success on grounds of its outreach and depth of coverage (Ahmad and Farooq, 2010).

Successive governments have given high priority to self-sufficiency in wheat. Several instruments have been implemented for this purpose. One such mechanism is stock management through the Pakistan Agricultural Storage and Supply Corporation (PASSCO). In addition, successive governments have given support prices to wheat growers, maintained wheat stocks, established agro-industrial units for processing and preserving food items, and expanded storage capacity (FAO, 2009). A formal price support system was first introduced in 1960s by fixing wheat price, which later extended to rice, sugarcane, maize, potato, onion, gram, and oilseed. Keeping domestic prices of agricultural commodities lower than world prices has been a long-term policy, and a tool often used for this purpose was the scheme for compulsory procurement, which later replaced by a system of voluntary procurements.

Pakistan too has implemented a number of safety net programmes including cash transfers, school-feeding, safe motherhood and child nutrition programs. These safety nets covered over 2 million people (Ahmad and Farooq, *ibid*). The Banazir Income Support program (BISP) was a large-scale program that offered support services to low-income people, but its outreach and depth of coverage has been limited. The Ministry of Health has implemented programs to improve nutritional status of selected communities with support of the World Food Program and NGOs (FAO, 2009).

In a speech on 23 April 2013, the President of Pakistan indicated that a national food and nutrition security policy was in the process of being finalised. Key elements identified in the President's speech include: commitment to develop the agricultural sector; the need to sustain production of wheat as the staple food of more than 180 million people; and the need for greater investment and coordination within and across countries in agricultural research.

Sri Lanka

Sri Lanka's food security policy is covered under the Sri Lanka National Agricultural Policy (NAP-SL) (GoSL, 2014) and the National Nutrition Policy of Sri Lanka 2010 (NNP-2010) (GoSL, 2010). NAP-SL recognizes the importance of the agricultural sector for the economy: it states that more than 70% of the population living in rural areas depend on agriculture for their livelihoods; and contributes to 18% of national GDP and 30% of employment. It identified sluggish growth; regulatory constraints; fragmented land use; insufficient availability of water, credit, seed, technical know-how, marketing facilities, storage, transportation, and poor farming practices as main reasons for sluggish agricultural growth.

Goals and objectives identified in the NAP-SL include: increase agricultural production and productivity; maximize benefits and minimize adverse effects of globalization on domestic and export agriculture; adoption of sustainable, productive farming systems and improved agro-technologies; promotion of agro-based industries; and enhanced income and living standards of farming communities.

GoSL has implemented several programs in recent years for enhancing food security: national campaign for encouraging the production of indigenous food crops under *Api Wawamu – Rata*

Nagamu (Let's grow – develop the country) program;¹⁶ special programmes targeting identified priority sectors (water, soil); northern agricultural development; crop forecasting; dry zone livelihood support; and national agricultural research.

A national safety net program titled the *Samurdhi* (prosperity) program is in operation for many years, which provides a monthly allowance for low-income households along with scheme for encouraging savings in the formal banking sector that allows households the possibility for using it as collateral for securing microcredit.

Common themes emerging from national policies for food security

This section aims to identify common themes emerging from national food and nutrition security frameworks, and discusses important links that bind the region together. The national policy frameworks for food and nutrition security currently in operation in South Asian countries can be classified into the following broad themes: a) improving agricultural productivity and production systems; b) enhancing agricultural R&D, dissemination and sharing; c) managing food security risks and vulnerabilities; and d) safety nets.

Improving agricultural productivity and production

The need to enhance agricultural productivity and production is a common theme of food policy frameworks in South Asia, which also has significant implications for regional cooperation. South Asian countries share many agro-ecological zones, natural resources, river-basin systems, common topographies, climatic conditions and weather. Agro-ecological zones often extend beyond national political boundaries. Mruthyunjaya et al. (2003) classified south Asian agro-ecological regions into seven: hot arid, semi-arid, sub-humid to cold arid mountain, irrigated sub-humid, high rainfall humid, and sub-humid to humid coastal. The contiguous regions of Indian Punjab and Pakistani Punjab, Indian Bengal and Bangladesh, and *terai* regions of India and Nepal are some examples. These zones provide a basis for regional policy planning. Regional planning on an agro-ecological basis becomes stronger when it is noted that agricultural production in most of the productive and favourable agricultural regions with better soil and irrigation systems that fuelled the Green Revolution in the 1960s and 1970s has reached a plateau because of over-exploitation.

Identifying sustainable management practices covering soil, water and bio-diversity in these areas is an imperative and can offer greater economies of scope, particularly for implementing joint agricultural development programs in managing water, soil, bio-diversity, pest management, vulnerability mapping and planning. Agro-processing and regional marketing mechanisms involving farmers and the private sector, facilitated by government entities, is another area of greater potential. Joint research efforts based on these agro-ecological regions can be a vehicle for greater regional cooperation. Such programmes may lead to identifying practical and more sustainable solutions. Regional marketing mechanisms may also allow for greater benefits to societies through efficient use of common infrastructure (road networks and irrigation systems) and expansion of trading opportunities for agricultural inputs, outputs, technology and machinery.

¹⁶ The annual report of the Ministry of Agriculture has identified 23 projects implemented under this program prior to 2012 and additional 15 programs proposed to be implemented in subsequent years (MoA, 2012)

Agricultural R&D, dissemination and knowledge sharing

National food and nutrition frameworks in South Asia have emphasized the need to develop appropriate technology for favourable and unfavourable areas; developing drought and flood resistant seed varieties; disseminate new technologies to farmers; and sharing of knowledge among research institutes and expertise across countries. In addition, R&D in seed production, germplasm, livestock rearing and animal production, post-harvest losses management, agro-processing and value addition, soil conservation, and bio-diversity management have also been identified as key areas for intervention.

Inability of smaller countries to secure adequate investment in R&D programmes as a key constraint has been recognised. This is particularly a compelling reason because of the long gestation period between investing in R&D and yielding tangible results. R&D requires persistent effort and investment commitments over many years. Long gestation periods often lead governments to give low priority to investment in R&D, owing to competing and urgent demands on government budgets, but also due to lack of a long-term view of development requirements. Investment is only one part of the problem. Inadequate human resources, and laboratory facilities as well as supplies on a regular basis are known to hinder progress in agricultural R&D.

Regionally coordinated agricultural R&D effort would allow sharing of agricultural R&D across South Asia, and is likely to yield better results due to greater economies of scale and scope. The SAARC process already has several such mechanisms, but their effectiveness in developing agricultural R&D is yet to be assessed and taken remedies, if required. Identifying and implementing a sustainable financing mechanism will require deeper probing and planning for it to become an effective instrument for sustainable food security.

Managing food security risks and vulnerability

Vulnerability is a key dimension of food insecurity. Risks pose threats to availability, accessibility and food absorption. Availability is affected through shortfalls in food production due to floods, droughts, and inability to import or transport food. Accessibility is affected by income shortfalls, changes in prices, loss of employment, and shocks emerging from international commodity markets. Weaknesses in absorption arise due to biological factors (disease prevalence), but they are often a result of environmental factors such as inadequate access to clean water, sanitation, lack of clean energy, and lack of knowledge of food preparation.

These risks may affect food security temporarily, but often with long-term consequences. Transitory food insecurity caused by natural disasters requires rapid responses; but long-term and persistent food security risks, often caused by structural weaknesses, need change in economic policy and reforms. These structural weaknesses may include but not limited to weak rural infrastructure, imperfect and fragmented markets, lack or inadequate agricultural credit, insurance schemes and periodic non-availability of agricultural inputs (seeds, pesticides and fertilizer). They often exacerbate food insecurity risks.

Some risks need to be managed nationally, but a regional approach is required when issues involve trans-boundary implications such as climate change, pest and disease spreads, natural disasters, and policy spillovers.

The SAARC has a long list of programmes that cover such regional issues. In 2003, SAARC established a Trans-boundary Animal Diseases Coordination Unit, along with a Regional Support Unit, equipped with an epidemiology unit for surveillance of different diseases. Although on plan, the progress in identifying regional reference laboratories for control of Foot & Mouth Disease, *Peste des petits ruminants* and Avian Influenza is limited. There is unmet demand for controlling trans-boundary animal diseases through the establishment of surveillance, early warning system, regulatory policies, public awareness programs, epidemiology studies, diagnosis, and control strategies. Similarly, there is potential for controlling, adapting and mitigating to climate change. Monitoring climate change at the regional level is likely to be cost effective and will offer greater economies of scale and scope.

Ensuring food safety and quality is another area for potential cooperation, particularly in view of freer agricultural trading environment being pursued through regional trading arrangements. In such an eventuality, consumers will need reassurance that food they import and consume is safe and free from pesticide residues and other undesirable elements. For this, cultivation methods, processing, storage and transportation methods need to be monitored, and consumers ought to be informed of their quality and safety. Harmonisation of policies on Sanitary and Phytosanitary (SPS) measures across countries is another area with greater potential for regional cooperation.

South Asia launched the new SAARC Food Bank (SFB) during the 14th SAARC Summit held in New Delhi. New guidelines on withdrawals and negotiations, and definitions on food shortages and quality standards of grains have now been established. Whether the new guidelines will allow countries in the region to effectively use the SFB reserves to receive grain supplies through the system is yet to be seen. A recent review, however, suggested that even the new guidelines do not contain a clear mechanism to release stocks when disasters occur; neither does it identify storage facilities or border points where food stocks can be delivered (Robinson, 2011).

Safety nets

Safety nets programmes can directly or indirectly enhance food security, primarily through their impact on enhancing stability of consumption. All the South Asian countries, with the exception of Afghanistan and Bhutan, have implemented safety net programmes. A considerable amount of financial, human and other resources are spent on safety nets. While some programmes have contributed to enhancing food security, their true impacts are not well understood. Some countries have implemented them on experimental basis. Beneficiary targeting, outreach and depth of coverage are often difficult, but some countries such as India have a vast experience in implementing safety net programmes that could provide valuable lessons to other countries in the region. The regional forum may perhaps be the best instrument for sharing such knowledge.

5. Opportunities for realizing food and nutrition security in the Post-2015 era

What should be the post-2015 food security agenda for South Asia? The challenge for the region is not just to ensure food security to an estimated 295 million people currently undernourished, but also to feed 2.2 billion people expected to inhabit the region by 2050. Doing so without damaging the environment further will determine the extent to which sustainable food security can be achieved.

Eliminating food insecurity and agricultural sustainability will require, as the Rio+20 Summit in 2012 called for, a holistic approach that promote sustainable agriculture while ensuring economic

viability of farm operations and sustainability of the resource base. Such a framework should be inclusive and allow for economic transformation. In this context, it is worth examining the UNGA Open Working Group's draft of the Sustainable Development Goals under food security, which will provide the basis for Sustainable Development Goals (SDGs) after the expiry of MDGs in 2015. Goal 2 (End Hunger, achieve food security and improved nutrition, and promote sustainable agriculture) has identified eight sub goals. Goals 2.1 and 2.2 indicate the need to work towards ending hunger and ensuring access to safe, nutritious and sufficient food all year round, and end all forms of malnutrition by 2030. The subsequent six goals relate more to mechanisms for ending hunger and malnutrition. They include: (a) doubling agricultural productivity of small-scale food producers; (b) ensuring sustainable food production systems and implementing resilient agricultural practices; (c) maintaining genetic diversity; (d) increasing agricultural investment; (e) correcting and preventing trade restrictions and distortions in world agricultural markets; (f) adopting measures to ensure the proper functioning of food commodity markets and their derivatives.

End hunger and achieve food security for all

Each proposal including the goals on ending hunger and malnutrition by 2030 includes qualifying statements. With reference to the first goal which calls for ending hunger and ensuring access to safe, nutritious and sufficient food all year round by all the people is qualified by adding the term “in particular the poor and people in vulnerable situations including infants.” A question that needs to be asked is whether these qualifying statements would limit the scope of Goal 2 merely to ending only extreme forms of hunger. As noted above, the generally reported figure on undernourishment refers to a target group of chronically undernourished people, but excludes people doing normal jobs. The second related issue is the period on which hunger is to be eliminated. Goal 2 proposes hunger to be eliminated by 2030. However, it appears that food security, if interpreted as ending chronic undernourishment, is within reach of South Asia, as long as there is political will and a coherent set of policies are implemented. Thus, a more ambitious target, for example, eliminating all forms of hunger by 2030, would be more appropriate.

Doubling agricultural productivity of small-scale farmers

Similarly, the call for doubling agricultural productivity and incomes of *small-scale food producers* has been made somewhat narrower in scope by limiting the target group to women, indigenous peoples, family farmers, pastoralists and fishers. This group indeed needs special attention because much evidence suggests that they are highly susceptible to food insecurity shocks. However, the proposal needs to be evaluated against food needs of people currently undernourished along with demand for food from a relatively wealthier and large population, expected to reach 9.2 billion by 2050. To meet the food demand of this population, FAO predicted that food production should be increased by 100% in developing countries and 70% globally. Doubling food produced by smallholders is unlikely to yield this target. The available evidence suggests that smallholders' contribution to food production is close to or slightly above 50% of total farm output (Thapa and Guiha, 2011). Attaining even this target is becoming difficult for a number of reasons. First, smallholders generally occupy relatively less productive or marginal lands, often without irrigation facilities; and hence increasing productivity of smallholder agriculture will require significant technological advances in seed varieties and new forms of agricultural practices. Second, agricultural productivity even in farmlands with irrigation has reached a plateau, or even declined in some areas including in major irrigated areas of Asia such as the Indo-Gangetic plain. This is primarily due to

displacement of cereals by more profitable crops; diminishing returns to modern varieties when irrigation and fertilizer use are already at high levels; and the low price of cereals that farmers receive relative to input costs, making additional intensification less profitable (Hazel, 2009). Doubling agricultural production even including favourable areas is difficult, and thus, promoting smallholder agriculture along will not be sufficient to meet rising food demand.

Smallholders dominate the farming system in South Asia. They are characterized by small land parcels, rudimentary production technologies, weak or non-existent access to agricultural extension services, unorganized labour institutions, and small capital / labour ratio. In countries where agricultural capital stock has grown, it has grown slowly, often at a slower rate than growth in rural population. Thus, they are unable to produce a surplus large enough to generate adequate income for the family, keeping them in perpetual poverty and food insecurity. Whether the smallholder agriculture can be revitalised so as to generate adequate surplus and achieve structural transformation required for a broad-based development is a contested issue. Evidence suggests, however, that smallholder agriculture gives way for greater land consolidation over time with development.

Ensuring sustainable food production systems and genetic diversity

The SDGs call for ensuring sustainable food production systems and implementing resilient agricultural practices for increasing agricultural productivity and strengthening capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters. It further calls for maintaining genetic diversity of seeds, plants and animals by managing genetic materials, establishing genetic banks at national, regional and international levels and ensure access to and fair sharing of benefits from the use of genetic resources and traditional knowledge. These mechanisms provide some critical aspects required for realizing agricultural sustainability.

However, sufficient flexibility needs to be built into the framework to allow for community acceptance of sustainability goals and to accommodate community aspirations and constraints, depending on their stage of development. This is particularly noteworthy when sustainability is viewed as a process rather than a particular state, requiring each community, society or country to identify specific goals and objectives of sustainability relevant for that society. A society is unlikely to agree to and adhere to goals and objectives imposed on them from outside. Thus, post-2015 development agenda needs to include mechanisms to identify societal goals and objectives on food security that are identified based on local knowledge and available resources within the system.

Agricultural systems are likely to face stresses arising from physiological conditions (soil, temperature and rainfall), changing market conditions (commodity and inputs price changes), social aspects (labour availability and aspirations), and capacity of self-organization (learning and social institutions and networks). Identifying factors that enhance resilience of an agricultural system and devising mechanisms to strengthen those factors will be required to ensure system sustainability. The post-2015 development agenda will need to initiate a dialogue with national authorities and regional organisations for identifying sustainable goals and objectives together with factors of system sustainability.

Managing climate change will require managing the landscape effectively. This should be done at both national and regional levels. Natural ecosystems and agricultural production systems within each countries' political boundary needs to manage effectively. However, ecological systems

often spread beyond national boundaries. For example, the Ganges-Brahmaputra river basin system in the continental South Asia spread across Bangladesh, Bhutan, India, Nepal and Myanmar. Sustainability of food production systems will demand effective management of these macro ecological systems optimally. If managed well, these systems can be a powerful force of resilience because these macro regions and ecological systems have the capacity to absorb regional climatic variations far better than their constituent sub-regions acting alone. Even when weather can have impact, a large region is likely to be able to withstand food production to meet the requirements of the entire region. In this context, the post-MDG agenda should also devise mechanisms for effectively managing large ecosystems.

Climate change and its impacts have made it even more difficult for the region to eliminate food insecurity. Extreme weather events push missions into transient food insecurity, but they also create a discernible influence on the long-term viability of food production systems. This is partly owing to the geographical and topographical features of the region that opens up possibilities for high vulnerabilities to disasters such as extreme temperatures, irregular rainfall, melting of glaciers, forest fires, rising sea levels, mountain and coastal soil erosion, and saline water intrusion (UNEP 2003; ESCAP 2013). Water basins are overused, polluted and salinized, leading to water shortages and decreased crop production. Variations in temperature and precipitation is likely to have a big impact on agricultural production, as 70% of food production in South Asia is linked to monsoon rains. Secondly, it is due to the nature of agricultural production practices being used. Agriculture is the main user of water resources, and over the years per capita water availability is estimated to have declined by 70% in the region since 1950 (Langton and Prasai 2012). The demand for water is growing faster due to population growth, increased industrial and agricultural activities. Thus, current water-intensive agricultural practices are unlikely to be sustainable in the long run. With these effects, it is possible for 15-30% decline in productivity of most rice and cereal varieties across South Asia (IFAD 2008), and 4-10% decline in cereal production by the end of the 21st century (Khatun and Hossain, 2012).

A common obstacle to managing ecological systems is what was termed as the “tragedy of the commons” (Hardin, 1968). According to Hardin, two fundamental reasons lead to the tragedy of the commons: everyone owns them, and no one at the same time; and they are “open to all” for using. Hardin believed that open use of common resources cannot be sustainable and are likely to end up in ecological disasters, and thus recommended private property rights as a solution. However, the tragedy of the commons is not inevitable, and there are many successful cases where common properties are used effectively without undermining their regenerative capacity (Ostrom, 2008). Design principles suggested by Ostrom (ibid) for the sustainability of common property systems include: (a) effective monitoring by the society, rather than imposed from above; (b) graduated sanctions for those who break rules; and (c) access to cheap conflict resolution mechanisms. It is high time for individual nations, as well as South Asia as a region at large, identify such mechanisms for managing South Asia’s ecological resources for ensuring sustainability of ecosystems and food security.

Investing in agriculture and proper functioning of agricultural markets

The last three proposals – investing in agriculture, correcting and preventing trade distortions and adopting measures to ensure proper function of food markets- are undoubtedly useful for revitalising agriculture in developing countries. The proposal refers to the Doha Development Round

as the reference for taking action to correcting and preventing trade distortions. Given the failure of the Doha Round negotiations to identify a mechanisms acceptable to both developing and developed countries to correct agricultural trade distortions, it is unclear at this stage how the process can be taken forward. The proposal on investment calls for investing in rural infrastructure, agricultural research and extension services, technology development, and plant and livestock gene banks to enhance agricultural productive capacity in developing countries, in particular in least developed countries. While investment in enhancing agricultural productivity is undoubtedly necessary, investments are also required in enhancing market participation of smallholders in developing countries, generating and disseminating knowledge on nutritional value of nationally and locally available food varieties so as to create better food habits.

The call to adopt measures to ensure proper functioning of food commodity markets appears to be limited to containing extreme food price volatility. Other critical functions of the market mechanisms, more specially, for attracting investment into agriculture by farmers and the corporate sector and for reducing producer transaction costs in participating in markets, which in many ways are fundamental to competitiveness of the agricultural sector, are missing from this discourse. It is difficult to attract investment into agriculture both from farmers themselves and the private corporate sector without having effective and competitive agricultural markets for inputs, outputs, and services. The current systems are distorted by many factors: cartels of input suppliers, millers, transporters and wholesale traders; agricultural policies including imports and exports that are determined by political economy considerations than economic efficiency; agricultural price distortions emanating from agricultural subsidies; and anti-agricultural bias created by incentives to industrial and services sectors. As Gulati and Pursell (2008) showed that the relative rate of assistance (RRA) provided to agriculture has been negative in Bangladesh, India, Pakistan and Sri Lanka with the exception of four years in India since 2004. This indicates that incentives for rural sectors have been less than incentives provided for their non-agricultural tradable sectors.¹⁷ Recent research also indicate the need to link agriculture with industrial and services sectors for enhancing productivity, raising farmer incomes and allow for broad-based structural transformation to take root in developing countries (Losch, et al. 2012). All these factors have contributed to create a large wedge between farm gate and consumer prices. This became clearly evident during the 2007/08 food price crisis where high international food prices transmitted to national consumer prices almost at the same level, but with limited or no gain to producers (Dawe, 2008).

Structural transformation in agriculture – a missing link

Ensuring the proper functioning of food commodity markets and their derivatives will require a broad-based approach to agricultural development encompassing structural transformation in agriculture and removing anti-agricultural bias in agricultural policy. This is because agriculture's role in economic development has changed from the traditional role it expected to play. As noted by Byerlee et al. (2009) globalisation, integrated value chains, rapid technological and institutional innovations, and environmental constraints have changed the context for agriculture's role. Thus, a

¹⁷ This study covered the period up to 1955-2004. The policy environment has changed significantly in the recent past, and hence the results may not necessarily be applicable for all the countries. Continued lacklustre performance of the agricultural sector compared to industrial and services sectors, especially agricultural sector's inability to attract a significant amount of investment may mean that anti-agricultural bias of policy may not have changed much in recent years, if not worsen.

new paradigm where agriculture's multiple functions including its role in triggering growth, reducing poverty, narrowing income disparities, providing food security, and delivering environmental services need to be recognised.

Fulfilling multiple roles will require agriculture to go through radical structural transformation. The current structure of agriculture consisting of a very low share of agricultural value added in GDP with a high share of agricultural employment as a share of total employment cannot be sustainable because current gap implies a widening poverty gap between those in agriculture and other sectors. In other words, those in agriculture are becoming poorer compared to those in other sectors. The current structure encourages agricultural labour to move out of it, usually to urban areas, than into productive agricultural activities (Mazumdar, 1987); discourages young and talented people from entering into agriculture; and discourages the farmers and the private sector in investing in agriculture. As a result, agriculture continues rely on old production and processing technologies, trapping a large population in agriculture without being able to move out of poverty. The combined effect is felt through inability of the agricultural sector to become a modern, market oriented sector (Lewis, 1954; Kuznets, 1973; Chenery *et al.*, 1986), and thus not being able to allocate resources according to their competitive advantages (Timmer, 2005). The first step for triggering a structural transformation is to remove anti-agricultural discrimination created by trade and other policies that support industrial and services sectors.

References

- Ahmad Salahuddin, MG Neogi and Noel P Magor, Addressing *Monga* through a collective regional forum response in the northwest of Bangladesh, Paper presented in the international conference Seasonality Revisited, 8-10 July 2009, Institute of Development Studies Unuted Kingdom.
- Ahmad, M. and Farooq, U., 2010, The state of food security in Pakistan: Future challenges and coping strategies, *The Pakistan development Review*, 49:4 Part II pp. 903-923.
- Ahmad, M., Farooq, U. 2010, The state of food security in Pakistan: Future challenges and coping strategies, in the *Pakistan Development Review* 49:4 Part II (Winter 2010) pp. 903–923.
- Behrman, J. R. and Deolalikar, A.B., 1989. Seasonal demands for nutrient intakes and health status in rural South India, in Sahn, D., (ed.) *Seasonal variability in Third World Agriculture: The consequences for food security*, Johns Hopkins University Press: Baltimore.
- Business Recorder, 2014, National food and nutrition security policy on the cards: President, Business recorder 23 April 2014.
- Byerlee, D., Janvry, A.D. and Sadoulet, E., 2009, Agriculture for development: towards a new paradigm, *Annual Review of Resource Economics*, Vol. 1, No. 1. Pp. 15-35
- Chenery, H.B., Sherman, R., Moises, S. (1986). *Industrialization and growth: A comparative study*, New York: Oxford University Press.
- Dawe, D., cereal price transmission in several large Asian countries during the Global Food Crisis, *Asian Journal of Agriculture and Development*, Vol. 6. No.1, pp 1-12.
- Deaton (1993) *Understanding Consumption*, Oxford: Clarendon Press. Jodha, N.S., 1978, “Effectiveness of Farmers’ Adjustment to Risk,” *Economic and Political Weekly*, Special Issue on Agriculture, A38-A48.
- Desai, S.B., Dubey, A., Joshi, B.L., Sen, M., Shariff, A., Vanneman, E., 2010. *Human Development in India: Challenges for a society in transition*, Chapter 13: Social safety nets, New Delhi: Oxford University Press.
- ESCAP (2013). *Statistical Yearbook for Asia and the Pacific 2013*, Bangkok: United Nations
- FAO (2008). *Regional Strategies and programme for Food Security in the SAARC Member states, and SAARC Secretariat*
- FAOSTAT (2013). <http://faostat.fao.org>
- Government of Bangladesh, 2008, National Food Policy Plan of Action (2008-2015), Food Planning and Monitoring Unit (FPMU), Ministry of Food and Disaster Management, Dhaka, Bangladesh August, 2008
- Government of Bhutan, 2014, Food and nutrition security policy of the Kingdom of Bhutan, 2014, Thimphu: Gross National Happiness Commission. http://www.gnhc.gov.bt/wp-content/uploads/2014/07/FNS_Policy_Bhutan_Changed.pdf

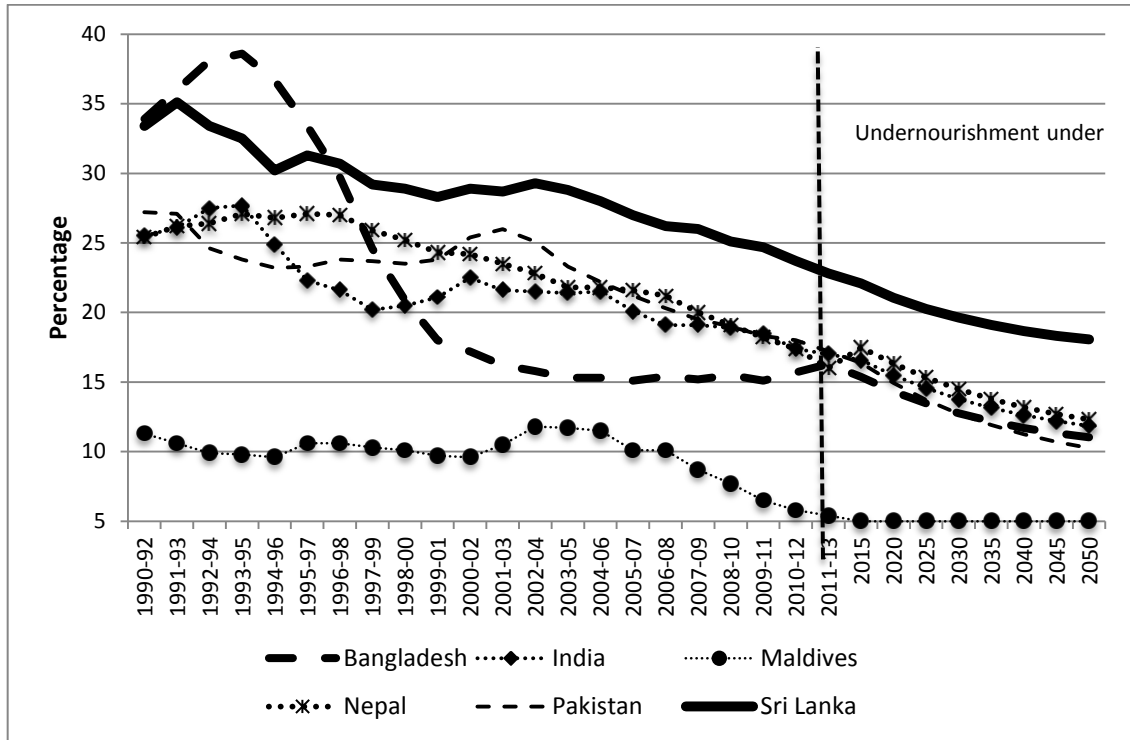
- Government of India, 2013, The national Food Security Ordinance, 2013. No. 7 of 2013, New Delhi: Ministry of Law and Justice, <http://www.prsindia.org/uploads/media/Ordinances/Food%20Security%20Ordinance%202013.pdf>
- Government of Nepal, 2010, Nepal Agriculture and Food Security Investment Plan – 2010
- Government of Sri Lanka, 2010, National Nutrition Policy, Colombo: Ministry of Healthcare and Nutrition.
- Government of Sri Lanka, 2014, Sri Lanka national Agricultural Policy, Colombo: Ministry of Agriculture.
- Griffiths P., and Bentley, M., 2005, Women in higher socio-economic status are more likely to be overweight in Karnataka, India,” in *European Journal of Clinical Nutrition*, 2005 Oct: 59 910): 1217-20.
- Gulati, A., Pursell, G, 2008, Distortions to agricultural incentives in India and Other South Asia, World Bank Agricultural distortions Working Paper No. 63. <http://www.worldbank.org/agridistortions>
- Hardin, G., 1968, The tragedy of the commons, *Science*, new Series, Vol. 162, No. 3859, pp. 1243-1248.
- Hazel, P.B.R., 2009, The Asian Green Revolution, IFPRI Discussion Paper 00911, Washington D.C.: International Food Policy research Institute
- Huang, H., Lampe, M.V., and Tongeren, F.V. (2011). Climate change and trade in agriculture *Food Policy*, 2011, vol. 36, issue S1. pp. S9-S13.
- International Fund for Agricultural Development (2008). Climate change impacts – South Asia, Note prepared under The Global Mechanism: United Nations Convention to Combat Desertification.
- Jodha, N.S. 1978, “Effectiveness of farmers’ adjustment to risk.” *Economic and Political Weekly*, Special issue on Agriculture, A38-A48.
- Joshi, P.K., 2013. National food security bill and need for a stronger implementation strategy, New Delhi: Governance Knowledge Centre, <http://indiagovernance.gov.in/thinkpiece/?thinkpiece=5>
- Khandker, S.R. 2009. Poverty and Income Seasonality in Bangladesh, Policy Research Working Paper 4923. Washington D.C.: World Bank
- Khatun, F., and Hossain, S. (2012). Adapting to Climate Change: Issues for South Asia. Kathmandu: South Asia Watch on Trade, Economics and Environment (SAWTEE).
- Kuznets, S. 1973, Modern economic growth: findings and reflections, *American Economic Review*, 63(3), pp. 247-258
- Langton, N. and Prasai, S., 2012, Will conflicts over water scarcity shape South Asia’s future? CSIS Issue perspective, Vol. 2, Issue 1. Centre for Strategic and International Studies.
- Lewis, A. (1954). Economic development with unlimited supplies of labour, *The Manchester School*, The Manchester School, 22(2), pp. 139-191

- Losch, B., Freguin-Gresh, S., White, E.T. (2012). Structural transformation revisited: Challenges for late developing countries in a globalizing world, World Bank.
- Mazumdar, D. (1987). Rural-urban migration in developing countries, Chapter 13 in M.R. Rozensweig and Stark, O., eds., handbook on Population and Family Economics, Vol. 1A, Amsterdam: Elsevier
- Ministry of Fisheries and Agriculture of the Republic of Maldives. 2006. Agricultural Development Master Plan (2006-2020)
- Mittal, S. and Sethi D., 2009. Food security in South Asia: issues and opportunities. Indian Council for Research on International Economic Relations Working paper No. 240. New Delhi: ICRIEA.
- Mruthyunjaya, Pal, S., Saxena, R., 2003, Agricultural research priorities for South Asia, Policy paper No. 20. New Delhi: National Centre for Agricultural Economics and Policy.
- Olson, R.O. (1960). Impact and implications of foreign surplus disposal on underdeveloped countries, *Journal of Farm Economics*, 42, pp. 1042-1051
- Ostrom, E., 2008, Design principles of robust property-rights institutions: What have we learned?, Working Paper 08-19, Workshop in Political Theory and Policy Analysis, Indiana University.
- Pinstrup-Anderson, P. and Jaramillo, M. 1989, The Impact of Drought and Technological Change in rice production on intra-year fluctuations in food consumption: The case of North Arcot, India, Chapter 16, pp. 264-284 in Sahn, D. (ed.) 1989, *Seasonal variability in Third World Agriculture: The consequences for food security*, Johns Hopkins University Press: Baltimore.
- Rahman, Z.H., Choudhury, L.A., and Ali, K.S., 2011, *Social safety nets in Bangladesh: review of issues and analytical inventory*, Volume 1. Dhaka: Power and Participation research Centre and UNDP.
- Robinson, M.J.D. 2011, *Regional grain banking for food security: Past and present realities from SAARC initiatives*, Policy paper, Jaipur: CUTS International
- Salahuddin, A., Neogi, M., Magor, N.P., Addressing 'Monga' through a collective regional forum response in the northwest of Bangladesh, in International conference on Seasonality revisited, 8-10 July 2009. London: Institute of Development Economics.
- Sahn, D., (ed.), 1989, *Seasonal variability in Third World Agriculture: The consequences for food security*, Johns Hopkins University Press: Baltimore.
- SAWTEE (2012). *Managing Climate Change, Water Resources, and Food Security in South Asia*, Paper presented at the 6th South Asia Economic Summit, Colombo, Sri Lanka, 2-4 September 2013
- Thapa, G., and Guiha, R., 2011, *Smallholder farming in Asia and the Pacific: Challenges and opportunities*, Paper presented at the IFAD Conference on New Directions for Smallholder Agriculture 24-25 January, 2011, Rome, Italy.
- Timmer, P. (2005). *Agriculture and pro-poor growth: An Asian perspective*. Centre for Global development, Working Paper, No. 63, July 2005

- Tomkins A. and Watson, F. (1989), Malnutrition and infection: A review, Policy discussion paper, No. 5. United Nations
- United Nations Environmental Programme, 2003. GEO Yearbook 2003: Nairobi: UNEP
- United Nations, 2000, The Millennium Declaration, UN General Assembly 18 September 2000, <http://www.un.org/en/development/devagenda/millennium.shtml>
- United Nations, 2011, The Millennium Development Goals Report 2011, New York: United Nations
- United Nations, 2012, Rio+20 Outcome document: The future we want, <http://www.uncsd2012.org/rio20inthenews.html>
- United Nations, 2013, Asia Pacific MDGs Report 2012/13 - Asia Pacific Aspirations: Perspectives for a post-2015 development agenda, Bangkok: United Nations
- United Nations, 2014, Outcome Document - Open Working Group on Sustainable Development Goals, Introduction to the proposals of the Open Working Group for Sustainable Development Goals, 19 July 2014, <http://sustainabledevelopment.un.org/owg.html>
- United Nations. 2012. The Zero Hunger Challenge. <http://www.un.org/apps/news/story.asp?NewsID=42304#VAAEY0vN7w>
- United Nations. 2014. The Millennium Development Goals Report 2014. New York: United Nations.
- Walker, T.S. and Ryan, J.G., 1990. Village and household economies in India's semi-arid tropics, Baltimore: The Johns Hopkins University.
- Wickramasinghe, U. 1995, Nature and causes of coping strategies among low-income rural households, unpublished PhD Thesis, Department of Economics, University of Hawaii at Manoa.
- Wickramasinghe, U. 1997, "Choice of Coping Strategies among Low-income Rural Households under Transaction Costs," Vidyodaya Journal of Social Science, Sri Lanka, Vol. 8, No. 1 & 2
- Wickramasinghe, U. 2000, "Services Trade as a "New Frontier" in South Asia: Is the Optimism Warranted?" in South Asia Economic Journal, September 2000, Vol. 1, No. 2. SAGE Publications India
- World Bank, 2013, World Development Indicators database. <http://data.worldbank.org/data-catalog/world-development-indicators>
- World Health organisation, 2013. Global nutrition policy overview: What does it take to scale up nutrition action? Geneva: World Health organisation.

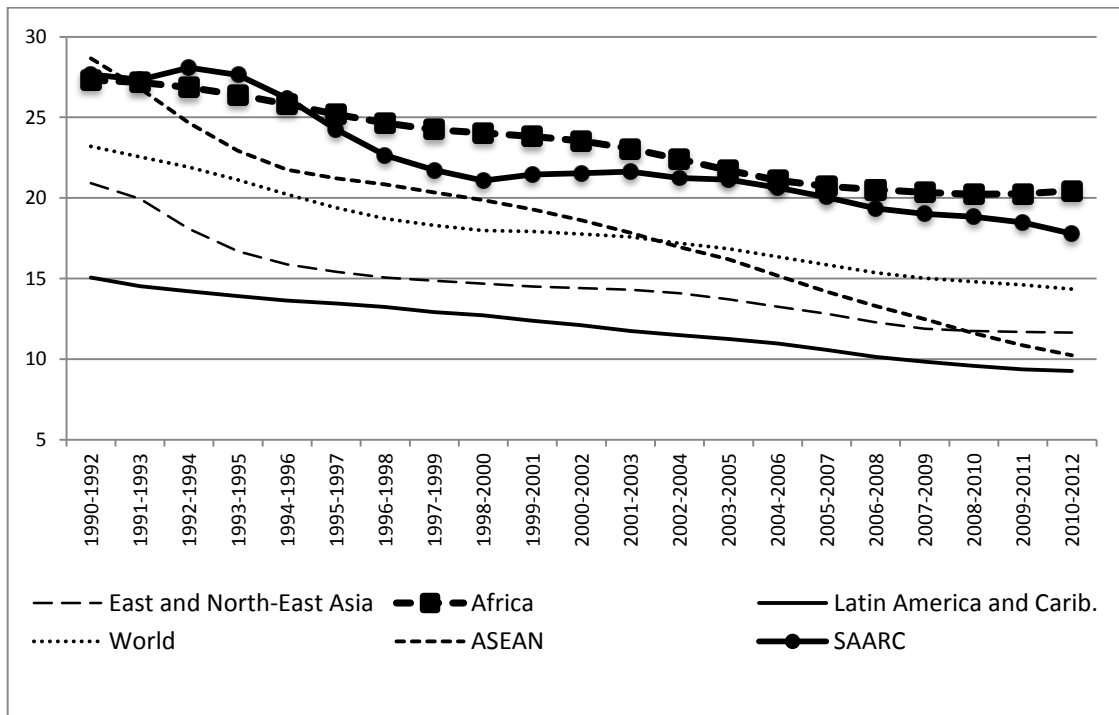
Figures and Tables

Figure 1: Prevalence of Undernourishment in South Asia



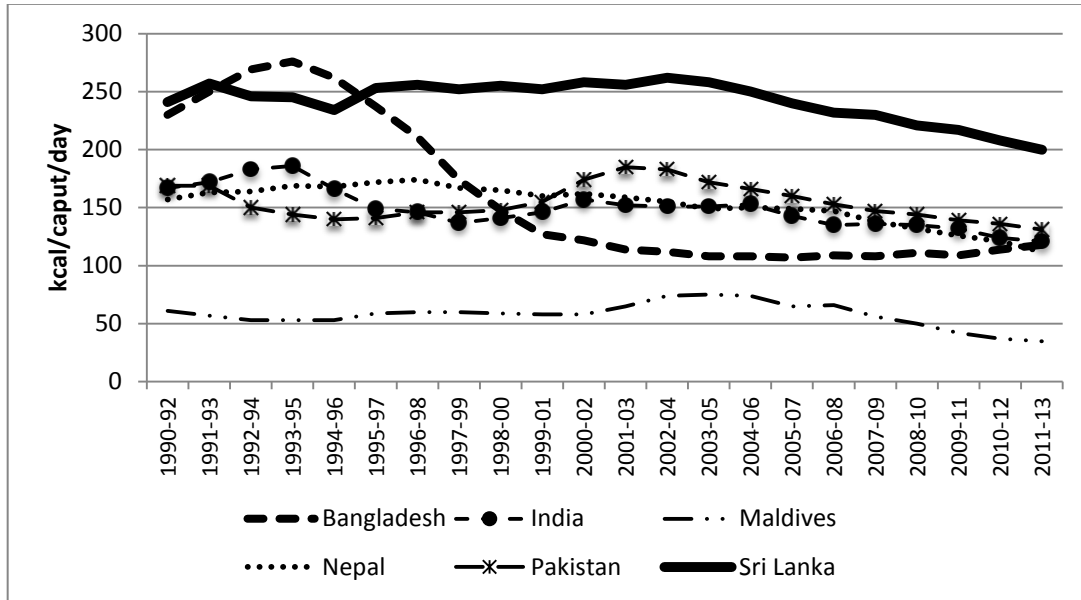
Source: Author, based on FAOSTAT (2014)

Figure 2: Proportion of undernourished people in selected countries



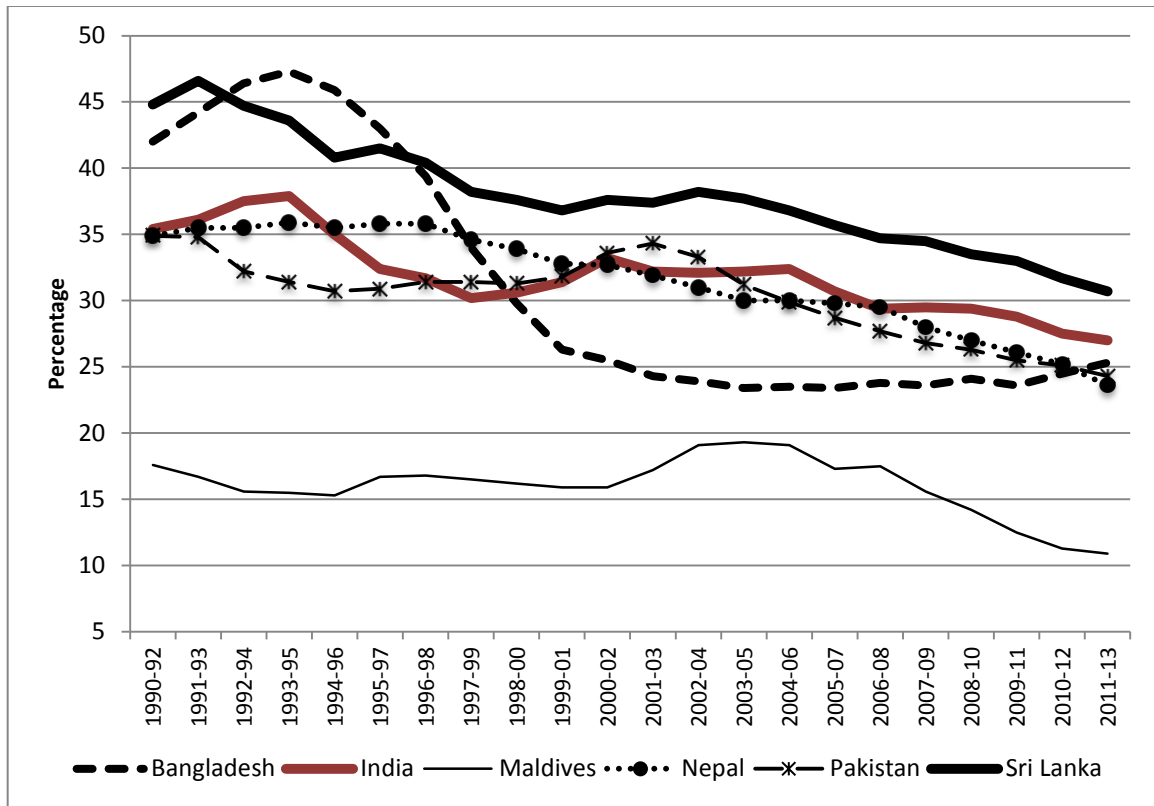
Source: Author, based on FAOSTAT (2014)

Figure 3: Amount of calories required to lift the undernourished out of food insecurity



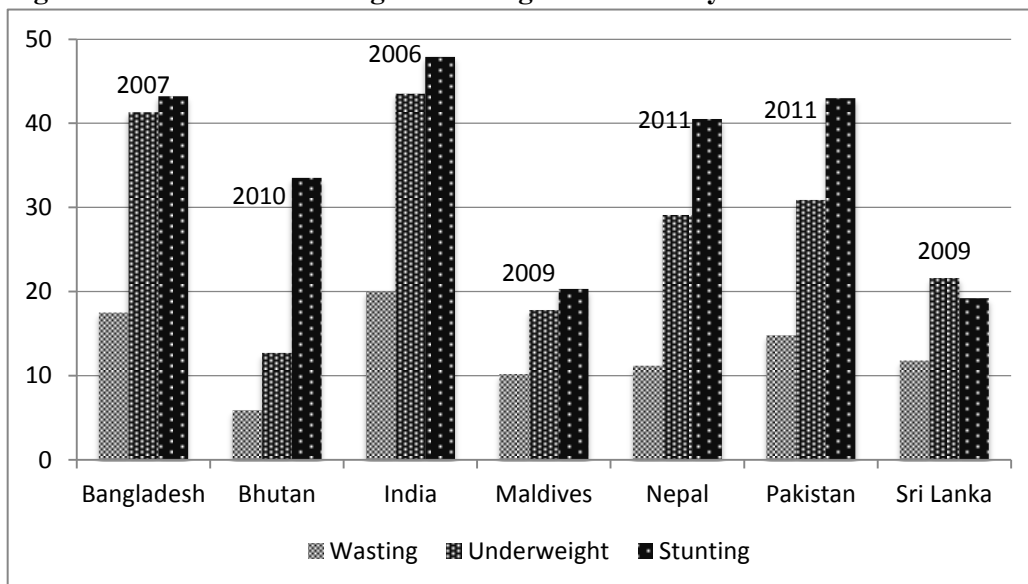
Source: Author, based on FAOSTAT (2014)

Figure 4: Proportion of people with food inadequacy



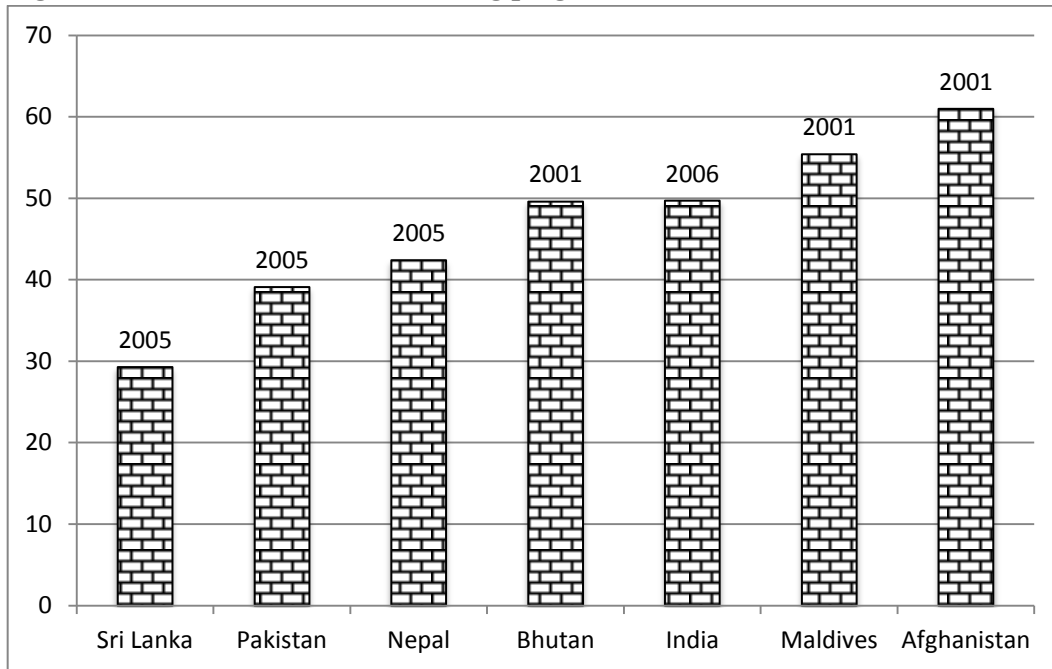
Source: Author, based on FAOSTAT (2014)

Figure 5: Malnutrition among children aged less than 5 years



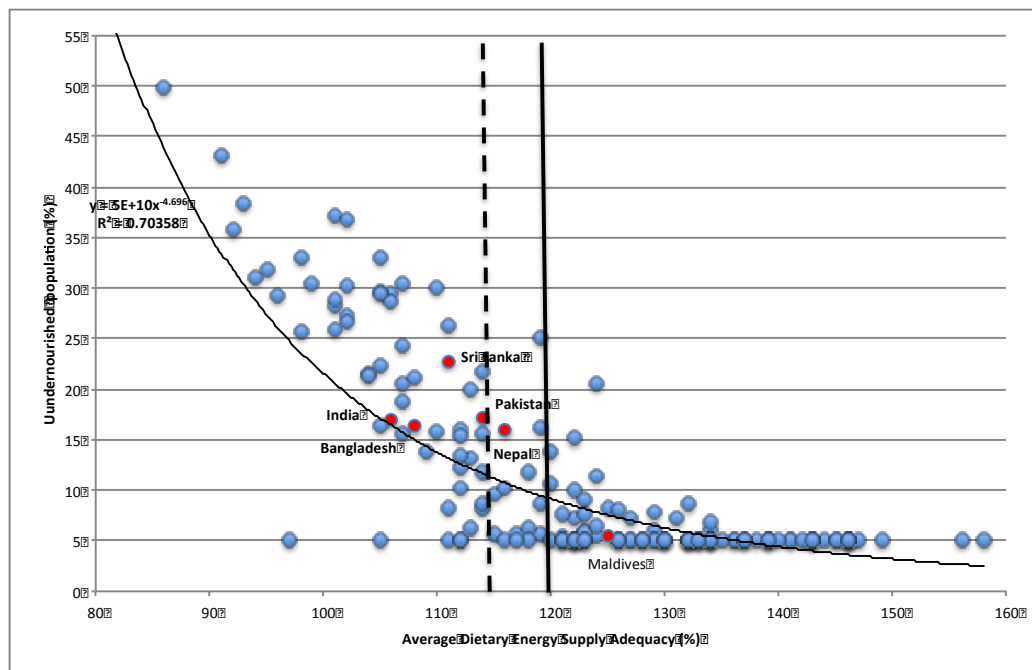
Source: Author, based on FAOSTAT (2014)

Figure 6: Prevalence of anaemia among pregnant women



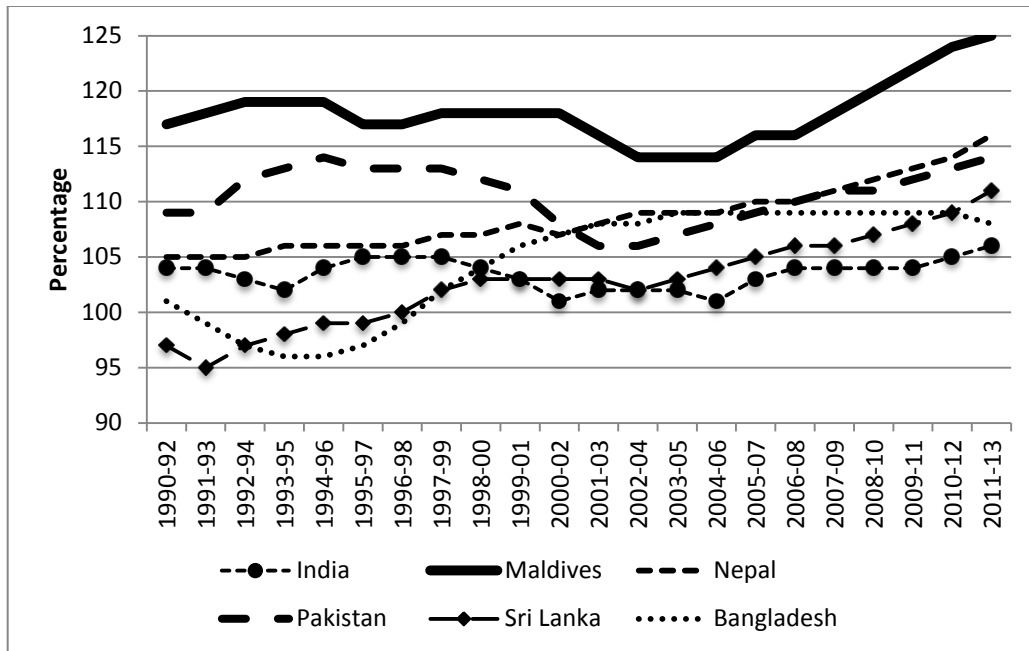
Source: Author, based on FAOSTAT (2014)

Figure 7: Prevalence of undernourishment and Average Dietary Supply Adequacy



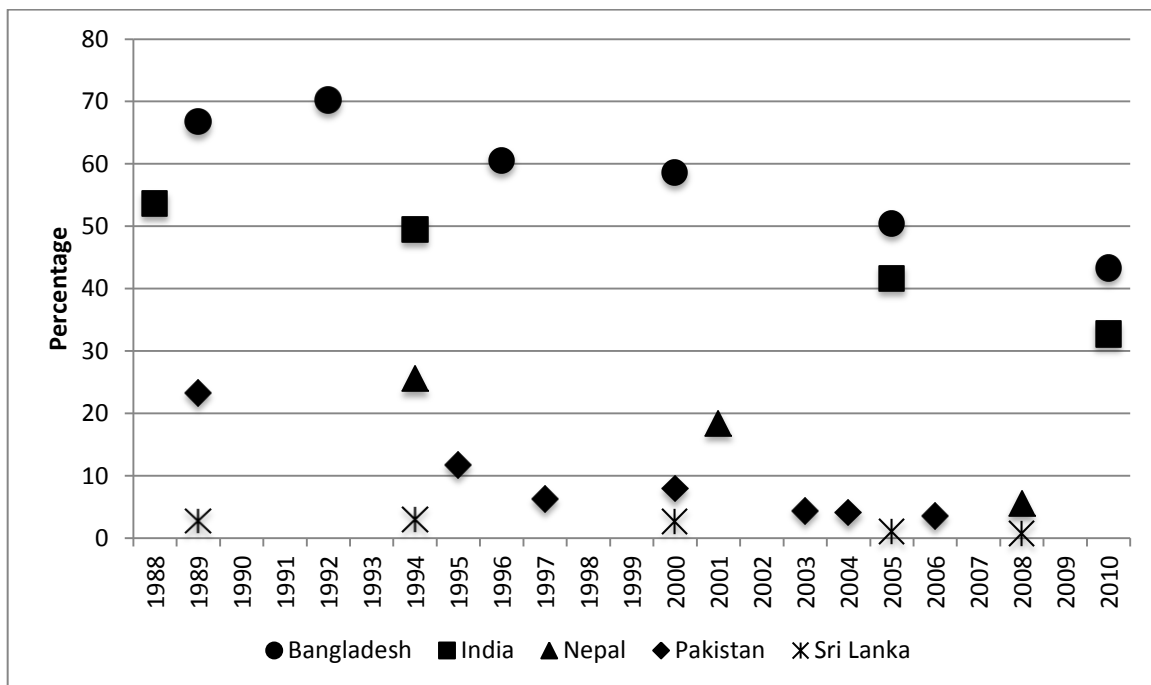
Source: Author, based on FAOSTAT (2014)

Figure 8: Average Dietary Energy Supply Adequacy Ratio



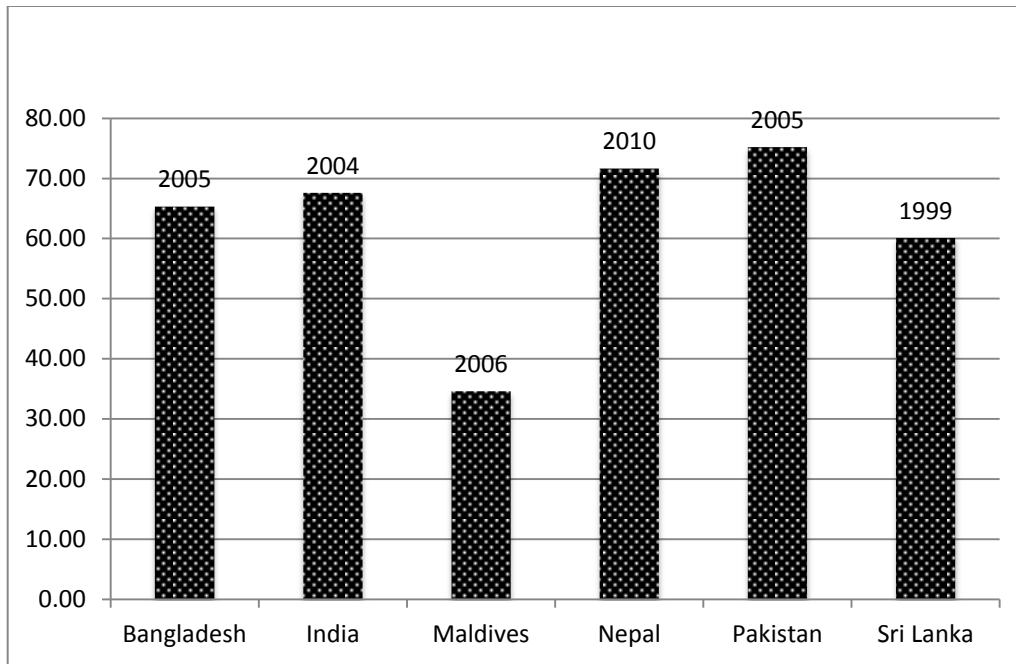
Source: Author, based on FAOSTAT (2014)

Figure 9: Poverty headcount ratio at \$ 1.25 a day



Source: Author, based on FAOSTAT (2014)

Figure 10: Share of food expenditure in South Asia (%)



Source: Author, based on FAOSTAT (2014)

Table 1: Domestic supply of food in selected countries of South Asia - 2011

Item	Bangladesh					India					Nepal					Pakistan					Sri Lanka				
	T. Supply (mt)	Local Prod (%)	Imp (%)	Stoc ks (%)	Exp (%)	T. Supply (mt)	Local Prod (%)	Imp (%)	Stoc ks (%)	Exp (%)	T. Supply (mt)	Local Prod (%)	Imp (%)	Stoc ks (%)	Exp (%)	T. Supply (mt)	Local Prod (%)	Imp (%)	Stoc ks (%)	Exp (%)	T. Supply (mt)	Local Prod (%)	Imp (%)	Stoc ks (%)	Exp (%)
Cereals (Excluding Beer)	34855	102.6	14	-17	0	215538	109	0	-4	5	7067	100.8	6.1	-7	0	31231	116	0	7	23	3519	78	42	-7	12
Starchy Roots	8695	99.2		0	1	51179	101	0	0	1	2798	95.28	4.7	0	0	3577	111	1	0	12	538	74	29	0	3
Sugar Crops	4671	100.0	0	0	0	342382	100	0	0	0	2718	100	0	0	0	55330	100	0	0	0	729	100	0	0	0
Sugar & Sweeteners	2031	36.4	76	-10	3	29353	108	1	2	10	118	113.6	24	-36	0	4593	102	3	-3	1	604	6	103	-9	0
Pulses	621	37.8	62	0	0	20677	85	16	0	1	315	89.52	18	0	7	1415	57	43	0	0	237	9	96	0	4
Treenuts	142	74.6	67	0	41	1690	70	58	0	29	53	26.42	102	0	28	126	29.4	72	0	1	38	100	8	0	8
Oilcrops	840	58.2	44	0	2	49911	104	0	-1	3	512	75.78	33	-9	0	6370	87.3	16	-3	0	1820	115	0	0	15
Vegetable Oils	1580	10.1	91	0	1	16414	57	49	-2	4	352	46.31	56	-1	1	3063	34.4	73	-3	4	251	25	75	1	2
Vegetables	4332	91.6	9	0	0	105174	102	0	0	2	3366	97.45	2.8	0	0	5150	104	6	0	10	950	80	22	0	2
Fruits (Excluding Wine)	4039	91.3	9	0	0	73712	100	1	0	1	1500	99.67	6.1	0	6	5684	110	4	0	14	865	95	8	0	4
Stimulants	65	93.8	9	0	2	733	175	17	6	98	11	154.5	18	0	82	125	0	101	0	1	29	1155	83	0	1134
Spices	470	83.0	18	0	0	3733	115	3	0	17	169	155	15	-56	14	281	69	36	0	6	109	63	61	0	24
Alcoholic Beverages	4	0.0	100	0	0	5933	102	1	0	3	53	88.68	13	0	0	20	2035	0	-200	1735	133	74	28	0	2
Meat	625	100.0	0	0	0	5163	121	0	0	21	327	100.6	0	0	1	2733	102	0	0	2	132	101	2	0	3
Offals	91	100.0	0	0	0	537	102	0	0	2	51	100	0	0	0	332	103	0	0	3	14	100	0	0	0
Animal fats	52	88.5	12	0	0	3670	101	0	0	1	40	82.5	18	0	3	893	92.4	8	0	0	18	11	106	0	11
Eggs	284	100.0	0	0	0	3425	102	0	0	2	36	100	0	0	0	592	100	0	0	1	68	99	1	0	0
Milk (Excluding Butter)	4035	86.7	13	0	0	123619	100	0	0	0	1671	98.44	1.6	0	0	36897	99.3	1	0	0	908	25	76	0	0
Fish, Seafood	3063	102.0	2	0	3	7882	113	1	0	13	57	87.72	12	0	0	394	151	1	0	52	607	73	31	0	4

Source: Author, based on FAOSTAT (2014)

Table 2: Domestic utilisation of food in selected countries of South Asia - 2011

Item	Bangladesh				India				Nepal				Pakistan				Sri Lanka			
	T. Supply (mt)	Food (%)	Man uf (%)	Waste (%)	T. Supply (mt)	Food (%)	Man uf (%)	Waste (%)	T. Supply (mt)	Food (%)	Man uf (%)	Waste (%)	T. Supply (mt)	Food (%)	Man uf (%)	Waste (%)	T. Supply (mt)	Food (%)	Man uf (%)	Waste (%)
Cereals (Excluding Beer)	34855	83	0	6	215538	86	0	5	7067	72	0	11	31231	80	0	3	3519	89	1	5
Starchy Roots	8695	83	0	10	51179	77	0	17	2798	78	0	14	3577	85	0	10	538	74	0	7
Sugar Crops	4671	6	94	0	342382	3	88	2	2718	35	50	10	55330	10	80	0	729	54	46	0
Sugar & Sweeteners	2031	62	11	0	29353	92	0	0	118	100	0	0	4593	100	0	0	604	96	0	0
Pulses	621	95	0	3	20677	84	0	3	315	91	0	4	1415	80	0	2	237	88	0	3
Treenuts	142	95	0	6	1690	99	0	1	53	100	0	0	126	101	0	0	38	61	0	0
Oilcrops	840	24	72	3	49911	16	68	4	512	4	93	2	6370	5	66	2	1820	77	23	0
Vegetable Oils	1580	60	0	0	16414	65	0	0	352	78	0	0	3063	69	0	0	251	24	0	0
Vegetables	4332	92	0	8	105174	94	0	6	3366	91	0	10	5150	96	0	4	950	89	0	10
Fruits (Excluding Wine)	4039	91	0	9	73712	85	0	14	1500	97	0	5	5684	97	0	4	865	89	0	11
Stimulants	65	98	0	2	733	98	0	2	11	100	0	0	125	98	0	2	29	107	0	0
Spices	470	99	0	1	3733	97	0	3	169	99	0	2	281	99	0	1	109	100	0	2
Alcoholic Beverages	4	100	0	0	5933	42	0	0	53	91	0	0	20	70	0	0	133	82	0	0
Meat	625	100	0	0	5163	100	0	0	327	101	0	0	2733	100	0	0	132	100	0	0
Offals	91	100	0	0	537	100	0	0	51	100	0	0	332	100	0	0	14	100	0	0
Animal Fats	52	96	0	0	3670	95	0	0	40	98	0	0	893	100	0	0	18	17	0	0
Eggs	284	82	0	10	3425	85	0	10	36	86	0	3	592	83	0	10	68	84	0	4
Milk (Excluding Butter)	4035	79	0	8	123619	79	0	4	1671	81	0	5	36897	85	0	10	908	94	0	1
Fish, Seafood	3063	98	0	0	7882	91	0	0	57	95	0	0	394	89	0	0	607	90	0	0

Source: Author, based on FAOSTAT (2014)