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## **Food Security in South Asia**

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The fact that food security is less a question of harvests and quantities rather than of entitlement and deprivation has convincingly been proved by Amartya Sen, the Indian Nobel prize winner in economics of 1998 in his seminal work on poverty and famine (Sen 1994). The distinction, however, was not awarded for his contributions to solving one of mankind's most elementary problems, but for his earlier "more academic" work. He had spent his youth in Dhaka, now Bangladesh, during the Bengal famine of 1943, which is said to have cost three million lives, but not so much because of a lack of food but because of a short sighted policy, lack of insight and mismanagement (Dréze et al. 1995, Dréze 1999, Knight 1954, Ravallion 1987). Sen's study of this and other famines of the twentieth century shows that problems of food security always need detailed analysis before any solutions may be recommended.

South Asia, where one or two famines occurred almost every decade in the nineteenth century, today feeds its population much better than in the past (Jalan 1997:136, Blyn 1966) although their number has more than triplicated since Independence (India and Pakistan: 1947). But this is only on average. There are still more people undernourished in South Asia than in any other world region despite the fact that the Government of India sits on unprecedented large stocks of food grain as well as foreign exchange reserves.

The following text will focus on the macro rather than the micro aspects of the problem. It will start with asking some basic questions: What kind of food has to be secured and for whom, why and how? Where should we draw the dividing line between food security and insecurity? And looking at the economics of food security: Has food to be produced locally? At what prize may food security come? And finally, who is to pay? The first question, however, is why we should look at South Asia.

### **Why South Asia?**

South Asia, or India, as the region south of the Himalayas was known until Independence, is home to one fifth of mankind. Together with Africa south of the Sahara South Asia stands for food problems, for natural calamities like floods and droughts. But South Asia has seen remarkable improvements; thanks to the "green revolution" the overall food position is better than at any time in recent history (Chopra 1986). But only on average of the population. South Asia still sees some of the worst forms of abject poverty and lack of food (Bohle 1997, Zingel 1999). There is no standard definition of South Asia. For all practical purposes the seven states that constitute the South Asian Association of Regional Cooperation (SAARC - SA7), i.e. India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan and the Maldives, belong to South Asia. They all were ruled directly or indirectly and for longer or shorter times by the British colonialists. The same applies for Myanmar (then Burma) and Afghanistan (much forgotten now). But Myanmar

joined the Association of South East Asian Nations (ASEAN) and Afghanistan the Economic Cooperation Organization (ECO - but so did Pakistan), too. They see themselves as parts of South East Asia and Central Asia, respectively, rather than of South Asia. In any case, the two countries have only less than five per cent of South Asia's (SA9) population; including them or not in our analysis would not yield very different results. After Independence the countries of the region maintained much of their colonial administrative system. Only India and Sri Lanka succeeded in maintaining (more or less) a democratic political system with political parties, fair and free elections based on universal adult franchise. All states pursued a highly interventionist if not socialist economic policy, especially with regard to food security. South Asia, thus, presents an interesting example for a case study on (national) food security.

### **What kind of food?**

South Asians are known to be vegetarians, eating rice as staple food plus some pulses and vegetables. This is true, of course, but needs differentiation, as the Anthropological Survey of India found out (Singh 1992). Upto one half of South Asia's inhabitants may be counted as upper caste ("non-scheduled") Hindus, who traditionally -- although not necessarily -- are vegetarians; this also applies to Buddhists, but only in principle (as can be experienced in Bhutan and Myanmar). Low ("scheduled") caste Hindus, most of the tribal (often Hindu) population, all of the 400 million Muslims (constituting the largest Muslim population in any world region) and the Christians are more likely to be non-vegetarians, with the major exception of pork in the case of the Muslims. If meat is eaten, it is mainly for the sake of taste, i.e. in small quantities. Not eating meat may not suffice in India to make one a "vegetarian": eggs, for example, are usually considered to be "non-veg" food; "vegetarians" may also shun dairy products and even vegetables like onions and garlic. On the other hand, chicken meat used to be allowed on "meatless days". But usually vegetables, especially onions, are essential complements, irrespective of rice or wheat (in the north west) being the main source of food energy. Vegetarian in the South Asian context does not mean raw vegetable as is often the case in the West: almost all food is cooked and fuel (mostly shrub, sticks, dung, wood), thus, is as important for feeding people as all the various food items. This is even more true for (drinking) water, which as a beverage is the most important food item and is also needed for almost all food preparations.

Food items can be substituted by other food items only to some extent, not the least for practical purposes: one needs different cooking utensils (and sometimes even different ovens and fuel) for example for cooking rice or baking the various kinds of "bread". Adaption to new food items usually is slow -- and irreversible. Food is also more than food energy; but if the energy intake is insufficient, proteins may be burnt as food energy, which increases malnourishment: deficiencies in protein and fat are more pronounced than deficiencies in energy intake.

### **Food security**

Food, although seemingly available in sufficient quantities on aggregate levels (e.g. the region or a country) and over longer periods, may nevertheless be available only scantily for certain areas, groups, individuals and for shorter periods of time, and even that on an irregular basis. For many even one meal per day on all days of the year would be a remarkable improvement. If this

affects a substantial part of the population over longer periods we would recognize this as the typical manifestation of a famine. But for most of those suffering from food insecurity the typical outcome would be less than average weight (wasting) and short size (stunting) and a greater probability to succumb to any illnesses. In short: Statistically, food security becomes a matter of the level of aggregation and of probabilities.

### **Food security for whom?**

One can observe groups with more pronounced deficiencies of (a) total food, (b) essential food items and food complements, (c) coping capacity (for lack of savings) and, thus, (d) a higher risk (or higher vulnerability). On the national level, Bangladesh and Nepal (and Afghanistan) lack food security more than the others, as can be seen from table 1 (cf. also: FAO Food Outlook, April 2003). Inside India, the so called Hindi or cow belt of northern and central India plus Orissa suffer more from insecurity than the rest of the country. In general, the "weaker sections" or poorer ones can look forward to less food security, they may be urban or rural population, often, although not necessarily, lower caste or tribal. There is a substantial gender bias when it comes to in food; children in South Asia are less well fed than those in Africa. Accordingly, girls from low caste families in backward areas are among the worst fed (Smith and Haddad 2000).

### **Why food security?**

The fact, that children in South Asia are less well fed than those in Africa, even at comparable family income levels, shows, that "development", if measured in per capita income, does not automatically bring out the levels of nutrition that could be expected. If we regard the well-being of the people (however defined) established only if a certain level of "basic needs" guaranteed for all the people and none of them suffering from hunger over any longer period of time, then food (supply) for all has to be secured.

### **How to secure food supply?**

Immediately after World War II broke out the British-Indian government started their public food distribution system (PDS) which has survived in India and other parts of the erstwhile Empire till today. Burma was the main "surplus" province of British India, the main harbour towns Calcutta and Bombay were the main "deficit" areas, and transport was easy by ship. Once the war started and the Japanese had taken Burma, the supply stalled. Imports from other countries were impossible because of submarines and the navy's own requirements of vessels. Poor weather conditions led to a shortfall in the grain harvest of 1943 and prices skyrocketed because traders withheld ("hoarded") supply in expectation of further price rises. When in this situation the administration of "surplus" provinces decided to close their borders, the poorer sections of Bengal were simply out-priced from the market. The problem was aggravated by the fact that two centuries of colonial rule and a fateful system of heavy land taxes and eviction in case of non-payment of taxes and rents to an ever growing number of "absent" landlords and middlemen had left so many of the rural population landless and with no other income than from casual labour. Labour was abundantly available and, even at distress levels of wages, not absorbed by

the market.

The food administration was unable to solve the crisis, especially not in Bengal where it developed into the worst catastrophe since the eighteenth century. Over the years, and especially outside Bengal, food management became more efficient and when another bad harvest struck in 1946 it could be well managed. Collective memory remembers the famine mainly as the result of the greediness of traders and hoarders; the public distribution system which evolved from the war administration had their ups and downs but has been quite popular especially in India and Bangladesh (De Vylder 1982, Tyagi and Vyas 1990, Zingel 2003).

The other major experience was the poor harvest of 1965, when famine could be averted in India and Pakistan thanks to the food aid from the USA and Canada at unprecedented levels. This aid, however, failed to make an impact politically, because it was tied to the superpowers' (US and Soviet Union) demand to end the border war between the two South Asian countries of the same year. The American vice president's talk of "food power" made it abundantly clear that the South Asian nations were much less independent than their talk of self sufficiency and self reliance would have people think to be.

India and Pakistan were saved from a further dependency on food aid after the almost instant success of what became known as the "green revolution". Research of the Rockefeller Foundation (i.e. US!) funded Centro Internacional de Mejoramiento de Maiz y Trigo (CIMMYT -- International Maize and Wheat Improvement Center) in Mexico had led to the development of high yielding varieties of wheat; seed was available in sufficient quantities when farmers and governments were ready to adopt them under the impact of failure of traditional seeds and production technologies. The "miracle wheat" became an instant success, which, however, was less predicted and planned as governments later used to claim. The new dwarf varieties (because of their short stems) were more demanding as far as quantities and timing of water, fertilizer and pesticide doses were concerned. Fortunately, as another unplanned result of problem management, India and Pakistan had just undergone major irrigation investments, so that water became available when needed.

Partition of British India cut through the system of the Indus and its five major tributaries in the Punjab (= five waters). These rivers receive most of their waters in the high mountains of the Himalayas and the Karakoram, and Pakistan, situated at the tail ends of the rivers, feared to be cut off by India which had started diverting water to its side. A war over water between the two neighbours could be averted only with the help (and money) of a group of friendly western nations. In 1960 the Indus Water Treaty was signed which allotted all of the water of the three western rivers (Indus, Jhelum, Chenab) with around three quarters of all water to Pakistan and all the water of the three eastern rivers (Ravi, Beas and Sutlej) with the remaining quarter of all water to India. Both countries built large dams and link canals: in Pakistan to divert water from the Indus into the Jhelum and on to the Chenab, the Ravi and the Sutlej; India diverted the waters from the Ravi, Beas and Sutlej before they enter Pakistan to the (East) Punjab and to Rajasthan. This solution may be regarded as uneconomical, but turned out to be highly beneficial politically, because the solution is very easily manageable as compared to an endless bickering over the waters as we can observe in the case of the Ganges, which is to be shared between India and Bangladesh, but in reality leaves Bangladesh high and dry, as they claim, during the essential pre-monsoon time. Likewise, domestically, the Indian states of Karnataka (upstream) and Tamil

Nadu (downstream) have been locking horns over the water of the Cauvery.

The first years of the "green revolution", i.e. the late 1960s and early 1970s, witnessed such an increase in wheat production, that India saw themselves becoming a major food grains exporter. But soon India had to experience a (minor) setback in wheat production and the social repercussions of the "green revolution" became evident. In Punjab, landlords (not all of them "big") had started to evict tenants and to cultivate their farms themselves and/or with hired hands. Higher incomes allowed them to buy machinery, again with a labour displacing effect. Ever since the "green revolution" has been brandished for their negative social impact rather for its economic success. But looking at the development of yields, we can clearly make out, that they have been rising ever since and have reached, on an average around thrice the level of the 1950s. The other complaint was that the "green revolution" was restricted to wheat and, thus, to the north west of the subcontinent. But rice yields have also improved: not exactly in such a dramatic way as wheat yields, but they more than doubled over the last half century. This benefited the east and the south of the subcontinent. Sorghum and millet, however, which are grown on the high plains of the Dekhan, did not see any improvement in yield and have been grown on less areas at marginal locations.

Another reason for the success of wheat and rice was the state's price policy (De Janvry and Subbaro 1986). De-linking their countries from the world market (India more than Pakistan) allowed governments to make their procurements of basic food items at below world market prices. They even continued the (war time) regime of regional price differentiation and restricted movements of food items between the different regions of their countries. They were obviously not aware of the farmers' price elastic reactions, i.e. of the depressing effect of low prices on production. Government intervention into food markets (Lele 1971) culminated in the early 1970s when Indira Gandhi "nationalized" food grain marketing in India and Zulfikar Ali Bhutto rice and oil mills in Pakistan. Both strategies utterly failed and had to be given up after a few months. Both actions were also fateful for the two top politicians' political careers. Since then the two countries have followed different paths. Pakistan by and by gave up the heavy intervention in the food markets; public food distribution became less important and was finally given up in the 1980s. Sugar was the last item rationed. The system was said to be more and more inefficient and few people relied on it at the end.

India still runs its system of public food distribution. The high food grain reserves mentioned above are, however, more the outcome of a politically motivated price policy. By the end of the 1970s a militant nationalism had evolved in the Indian state of Punjab, fuelled by the central government's (again: Indira Gandhi) attempt to install a regional government of their choice. When the central government finally tried to re-take control of the state (and the Sikhs' Golden Temple in Amritsar), tension had reached dimensions of a civil war; in 1984 prime minister Indira Gandhi was shot by her Punjabi body-guard. Subsequent governments managed to de-escalate the conflict, among others by granting generous support prices for wheat and rice, with Punjab, India's major "surplus" state, benefiting most from the high prices. The public distribution system is still working, but becoming more and more costly -- and some say: less efficient (Chopra 1981, Chopra 1988).

Let us analyse, thus, the major instruments of food security in South Asia, on the macro as well as on the micro level.

### **Instruments for food security I: Temporal adjustments**

Maybe the oldest instrument to secure food supply is to retain a part of the harvest and store it for the future. This always has been done on an individual basis and -- as a sign of good governance since times immemorial -- on a collective level as a prime responsibility of the state. In Moenja Daro, a centre of the Indus civilisation, structures of a large granary, more than 3,500 years old, can still be found. Since food items lose their quality over time, stocks have to be replenished by newer ones from time to time, a demanding organisational task which requires tight technical and financial scrutiny. Food grains always have been the bulk of food stocks. Inadequate storing facilities and bad management have always been major problems of South Asian food administrations (Chand 2002, Chand 2003). In India the Food Corporation of India is entrusted with most of government storage; there has been an impressive programme to build storage, but still much of the food grain is stored in the open (covered and plinth). Indian authors claim, that only a small percentage is lost due to improper storage. More may be siphoned off as "system losses" or is already unfit for consumption when purchased by corrupt procurement personnel. The enormous amount of present food grain stocks of over sixty million tons in India is an indication that storing no longer is an impossible task.

### **Instruments for food security II: Regional adjustments**

Until the colonial power built the railways, the "steel frame" of India, famines in one part of the subcontinent could happen while plenty of food was available in other parts; the worst (known) of such famines was one in Bengal in the 1760s, shortly after the East India Company had taken over the *diwani* (government) of the *subah* (province) from the mogul emperor. By the late nineteenth century the railway network allowed the transport of large quantities from one end of the "jewel in the crown" to another. Famines seemed to be a thing of the past. One of the reasons why the Bengal famine of 1943 could become so devastating was, that rice from Burma no longer was available because of the Japanese occupation and food from elsewhere could not be shipped to India because of too little transport capacity available (see above).

Today feeder roads reach even the remotest parts of the subcontinent. Many villages are still not connected by road, sometimes even not by a footpath (people have to balance on the little mud walls that separate the fields), but metalled roads will not be very far away. Only in times of extreme scarcities and massive food imports harbours may become transport bottlenecks. But this has become less of a problem after all Indian coastal states have built and/or expanded their harbours.

### **Instruments of food security III: Increasing production**

The really impressive expansion of food production has been dealt with already. This is true for almost all major food items. As far as cereals is concerned, it can be seen from table 2. Worth mentioning is the expansion of non-vegetarian food, even in India. Predominantly Hindu India consumes much more animal products per head of their population than predominantly Muslim Bangladesh. Most remarkable is the increase in egg and poultry meat production. Poultry farms

producing on industrial lines have become a common sight all over South Asia. Dairy production also multiplied. In the case of milk this has to do with packing: Milk quality constituted a major problem until polyethylene bags were introduced. Packed milk sells at a premium over "fresh" milk, because the buyer can be sure, that the milk has not been adulterated, which has been a common and hazardous (because untreated water was added) practice.

At various instances South Asian countries have become exporters of major food items. This especially applies to Pakistan where surplus (and often high quality) rice is exported and (cheaper) wheat is imported. India has become the second largest rice exporter in the world. There is, however, no major food trade between the states of the region, at least not officially: The boundary between India and Bangladesh runs over open plains through mostly densely populated areas; whenever prices differ in India and Bangladesh large quantities of food items are transported across the border unchecked and unaccounted.

#### **Instruments of food security IV: Imports and food aid**

From the 1940s until the 1970s the United States and Canada (plus Australia and later the European Community) were the major source of imports whenever there was a need. As a reaction to the Great Depression and the Second World War most countries had introduced a system of price stabilization and support for their major agricultural products. The response was so good, that large stocks could (or had to be) built up at a time when population growth accelerated in the then emerging "Third World". For India and Pakistan, in particular, doomsday scenarios of Malthusian proportions were feared to become reality. The United States already had helped to reconstruct Europe. It only seemed natural, and humanitarian, now to use agricultural surpluses as "wheat loans" (to be paid back in kind -- they were turned into outright grants later). It also seemed to be an appropriated measure to stem the "red tide" of communism in Asia. It was the time, when China "was lost" and other countries were bound to fall according to the domino theory. Throughout the 1950s and 1960s India and Pakistan imported millions of tons of food-grains on an almost yearly basis. The dependency was felt only in 1965, a year of an exceptional poor harvest, when India and Pakistan could be forced by the USA (together with the Soviet Union) to end their (short border) war. This would have happened again in 1971, when India and Pakistan were again at war, if food production had not risen dramatically as a result of the green revolution of the late 1960s.

Bangladesh, however, had to feel the force of "food power", when they became subject to the Cuba embargo of the USA. According to this embargo, countries were excluded from US aid, if they did trade with Cuba. Bangladesh during the first years after Independence followed an economic policy model close to that of India, the country that had helped then East Pakistan (Bangla Desh) to free themselves from (West) Pakistan domination. India, for this reason, was heavily leaning on the Soviet Union. It was the time of the final stage of the Vietnam War and the height of Socialist policy in India. The economy of Bangladesh at that time was going from bad to worse. Raw jute and jute products were the only export goods, the market for both of them stagnated and any export order was welcome. The export of jute sacks to Cuba presented the USA with a golden opportunity to discipline the Bangladesh government; a (possible) waiver was not granted. The Bangladesh government on their part had underestimated the extent of the bad harvest of that year; distress calls were sounded very late and the result was a famine, which cost

about 50,000 lives (Faaland 1981). It was the last major famine in South Asia (besides the five year drought in Afghanistan, which coincided with the Taliban regime). When the USA finally resumed their aid to Bangladesh, relief arrived at the time of the next (better) harvest, and had the typical price depressing effect.

As a result of the bad experiences with food imports, i.e. the Great Bengal Famine 1943, the Indo-Pakistan war of 1965 and the Bangladesh Famine of 1974, food imports/aid is discussed in South Asia as a political, not an economic problem. On the other hand, the green revolution saved India from any food related pressure in 1971. Ever since large food-stocks made India immune to "food power": it could manage the drought of 1987, had more negotiation power in the foreign exchange crisis of 1991, and after the economic sanctions in response to the nuclear tests of 1998. The drought of 2002 resulted in the most serious fall in production since decades, without threatening the (macro) food basis.

But there are also economic reasons, not to rely too much on the world market. The main argument is that India is the second largest consumer of food-grains (after China) in the world. Its food-grains consumption has almost the same size as the whole world market. If a shortfall of 30 m tons, like the one of 2002, had to be met by the world market, significant price rises are to be expected. This all the more, since markets today react instantly. Satellite images have improved market intelligence, traders are well aware of any presumptive increase in demand.

The unprecedented high foreign exchange reserves that India presently enjoys (and many other countries, thanks to record current account deficits of the USA) could erode very fast, as the example of other countries (e.g. during the "Asian crisis" of 1997) shows, they are, thus not a guarantee that foreign exchange will be available if needed for food imports. Srinivasan and Jha (1999) have shown with the help of a stochastic dynamic simulation model that variable levies on trade turn out to be superior compared to buffer stocks in stabilising prices under liberalised trade, although more to the benefit of consumers vis-a-vis the producers. This even holds true despite the fact that domestic prices are less volatile than international prices.

## **Instruments of food security V: Price policy and market intervention**

Governments, especially in India and Pakistan, have a long tradition of market and price intervention. This applies not only to state procurement and state trading for major food items (see above), but even more for intervention in the factor markets. Explicit and even more implicit subsidies have become powerful tools to stimulate production. Under conditions of a mostly arid or semi-arid climate, water is as important a production factor as land. Besides on-farm irrigation like the traditional Persian wheel, canals and tanks have been major sources of irrigation, often limited to the post-monsoon season. From the mid 1800s onwards the British built a series of barrages over the major rivers and distributed the water through an extensive network of canals to the fields. Such irrigation opened new areas for agriculture, like the "canal colonies" in the Punjab. Settlers were drawn from other areas, land also was distributed to army and government personnel. Agricultural production was increased and population pressure relieved *uno actu*. But irrigation was not free of charge. Water taxes or "cess" (in the north: *abiana*) were substantial and could cost up to a third of the production value. During the great depression such taxes were reduced as well as the land tax, and after independence the landlords, who dominated much of



politics (especially in West Pakistan), saw that agricultural taxes were virtually abandoned, until the water tax yielded hardly enough revenue to cover collection cost. After Independence large dams were built and water stored in huge reservoirs, allowing a much more secure water supply, which is so essential for high yielding varieties. These cost had to be borne by the exchequer and – to some extent – by foreign aid. Tube-wells, the major source of ground water mobilization, use pumps, which are driven by electrical or diesel motors. Such on-farm investment was financed by the government owned/controlled financial institutions at preferential conditions. The recovery rate of such loans has been poor. Especially the larger debtors/land owners did not bother to repay their loans or even any interest, expecting – for good reason – that such loans might be written off (loan holidays) and/or new loans granted. In addition to this diesel and especially electricity was – and still is – provided at highly subsidized prices and in some parts of India is even free of charge.

Such policies are, of course, financially unsustainable. The budget deficit in India already has reached the ten per cent (of GDP) mark. The chief minister of the Indian state of Andhra Pradesh successfully campaigned for raising water and electricity rates and even won his elections. This is a clear indication that voters know that free riding would be harmful on the longer run. Other governments have not followed as yet. Heavy subsidies on agricultural inputs, tax exemptions, tax evasion and non payment of liabilities deprive the state (and the parastatal or semi-government agencies) of the funds urgently needed to built up the infrastructure and to provide credit for on-farm investment.

## **Instruments of food security VI: Raising incomes and purchasing power**

Table 1 shows that per capita availability and consumption has increased in all South Asian states over the last four decades. The only exemption may be Bangladesh, where the per capita calorie intake has reached the level of the late 1960s, i.e. the years before the civil war. If we look at the composition of food, even here some improvement can be detected, at least as the intake of fats is concerned, which rose by almost one half. Levels are, however still very low by any standard. There are no up-to-date FAO figures available for Bhutan and according to the older ones, Bhutan has about the same low level of consumption as Bangladesh. But older figures for Bhutan suffer from highly inflated populated figures, the actual consumption per capita may be much higher.

This certainly is not the case for Afghanistan. The last figures available, i.e. for the mid 1990s, show a very low level of consumption, much lower than in any country of the region and much lower than before the pre-war times. But any figures for the last two decades are nothing more than intelligent guessing. Standard sources either repeat older, outdated figures or work with trend extrapolations. Under the condition that the political situation remains stable and/or can be improved, there may be much better data available within the next one or two years. A plan for an agricultural census were announced in December 2002.

India, Pakistan and Bangladesh were able to improve their food supply. The same holds true for Nepal, and to a lesser extent for Sri Lanka, which suffered from the long civil war in parts of the country. The greatest leap forward, however, was experienced by the Maldives, which once were the worst fed in the region and now are the best fed: The country has become a favourite tourist

destination and enjoys the highest (average) per capita income of all South Asian states. Almost all food is imported.

### **The costs of food security**

Economists emphasize, that costs are to be measured in opportunities foregone. If food security is measured in lives (or life years) saved, then we might expect, that no price would be too high. But there are convincing arguments, that not all public money spent under the headings of food security and food production does actually help to save lives. On the contrary: If it is true that much of the money does not secure anybody's food supply, there might be substantial opportunity costs in the form of money not spent on safe health, drinking water and other public amenities, not to speak of education.

In order to stimulate agricultural production, various subsidies have been paid, especially in India, Pakistan and Bangladesh. As for India, the major explicit one is on fertilizer. This one, however, aids a partly inefficient fertilizer industry rather than stimulate fertilizer consumption. As a result, the fertilizer consumption per area unit is stagnating and is even lower than in Pakistan and Bangladesh. Among the major implicit (hidden) subsidies, those on (canal) irrigation water, on electricity (for powering electric tubewells) and agricultural credit (e.g. for tractors) are the most important. (Canal) Water is not metered and provided free of cost or charged at flat rates. Accordingly water is overused, the cropping patterns do not reflect (economic) scarcities: crops that need a lot of water are grown at locations of high potential evapotranspiration and seepage, whereas high protein dry crops like sorghum, millet and pulses are more and more marginalised. Similarly electric power for agriculture is not metered and provided at flat rates or even free. Official figures show that one quarter of electricity consumption in India is for agriculture/irrigation. These figures, however, are questioned, because not measuring consumption is an open invitation for fraudulent practices, which at best are shown under "system losses". As in the case of water, power is subject to over-utilization (Chopra 2003). The effects are power shortages, extreme voltage fluctuations, load shedding and power cuts, resulting in high fixed and running costs for standby-arrangements (generators, diesel pumps) and wear and tear of the equipment. Revenue income from water and power is low and covers, at times, just the costs of collection. All other costs have to be met by the exchequer. No wonder, that the Indian budget deficit has reached alarming proportions (see above). As for agricultural credit India has provisions for priority sectors, basically a system of cross subsidizing agricultural credit at highly preferential conditions at the expense of the other sectors. Many of these credits are "not performing", i.e. neither amortization nor interest is paid by the creditors without any consequence. On top of it, there have been instances of loan waivers (loan *melas*); the defaulters even managed to get new loans. Most of the banks are in the public sector; the total amount of "non performing assets" must be substantial and not easily to assess (e.g. if loans are "repaid", but actually rolled over).

Government procurement has been so "successful", that India is now holding the largest food-grains reserves in the world. Even after the poor harvest of 2002 the buffer stocks are at least twice as high as considered to be needed for emergency. The quality of the stocks, however, has been widely questioned in India (Raghavan 2003, Report of the High Level Committee 2002). Given the fact, that around a fourth of the Indian population lives below the (national)

poverty line, which is defined as income sufficient to meet minimum food requirements, the buffer stocks today serve more the purpose of stabilizing/raising producer prices and incomes than securing food supply.

The public distribution system (PDS) suffers from its urban bias, as the Indian government consents in their economic survey (Tyagi 1990). Some authors go so far as to state, that the poor are rather hurt than helped by the system, for example when the government procurement drives up prices in the country side and poor farmers with no access to the PDS have to pay a higher price than without procurement (Ramaswami and Balakrishnan 2002, Shankar 2002, Swaminathan 1995).

## **Outlook**

Population growth will continue at least until the middle of the century. By then India may have surpassed China as the most populous nation, Pakistan is expected to rank third among all countries of the world, then. If a healthy economic growth, especially in India, can be maintained, food demand will increase much faster than population growth. It should be possible to meet such a higher demand by own production, since yields per area unit are still low in South Asia by international standards. Increasing production, however, requires a steady supply of inputs like water, power, fertilizer, pesticides and know how. Alternatively more food could be imported if India and the other South Asian states would decide to “globalize” their economies, i.e. to integrate into the global system of division of labour.

**Tabelle 1: South Asia. Food availability per head and day**

Country/ Years	Calories (Kcal)		Proteins (g)		Fats (g)	
	Total	Animal Product	Total	Animal Product	Total	Animal Product
<b>Bangladesh</b>						
1961-1963	2,090	63	42.9	5.4	15.5	3.8
1969-1971	2,122	67	45.2	6.1	15.3	3.9
1979-1981	1,975	60	43.6	4.9	14.6	3.6
1989-1991	2,065	60	44.4	4.9	17.8	3.5
1998-2000	2,101	63	45.1	6.1	21.5	3.9
<b>Bhutan</b>						
1966-1968	2,050	35	45.1	1.7	22.1	2.6
1969-1971	2,065	35	45.5	1.7	22.2	2.6
1975-1977	2,058	34	45.4	1.7	22.0	2.6
<b>India</b>						
1961-1963	2,048	112	52.5	6.1	31.4	7.5
1969-1971	2,041	105	51.0	6.0	30.3	7.0
1979-1981	2,083	120	50.8	6.8	33.3	7.9
1989-1991	2,365	162	57.4	9.0	41.2	10.9
1998-2000	2,426	194	57.8	10.5	47.2	13.0
<b>Maldives</b>						
1961-1963	1,545	151	45.3	22.4	32.0	6.1
1969-1971	1,624	192	53.2	28.5	37.1	7.7
1979-1981	2,165	185	69.2	28.1	30.6	7.3
1989-1991	2,365	305	72.0	28.3	47.0	14.2
1998-2000	2,578	650	112.9	79.3	65.1	30.0
<b>Nepal</b>						
1961-1963	1,833	148	47.7	7.7	26.8	10.2
1969-1971	1,832	150	48.5	7.9	25.2	10.5
1979-1981	1,891	158	50.3	8.6	26.3	11.0
1989-1991	2,443	159	63.0	9.0	32.3	11.1
1998-2000	2,381	160	61.0	9.2	34.4	11.2
<b>Pakistan</b>						
1961-1963	1,786	273	49.7	13.8	31.4	18.7
1969-1971	2,223	274	56.1	14.0	35.6	18.7
1979-1981	2,173	273	52.0	14.4	44.9	18.5
1989-1991	2,323	336	57.9	17.8	55.5	23.2
1998-2000	2,458	437	62.0	22.6	54.7	29.8
<b>Sri Lanka</b>						
1961-1963	2,138	105	43.6	9.0	46.0	5.9
1969-1971	2,289	104	46.5	8.9	46.2	5.9
1979-1981	2,348	114	46.8	9.4	46.9	6.5
1989-1991	2,222	124	47.6	10.4	43.9	6.9
1998-2000	2,360	156	53.4	13.7	44.8	8.5
<b>Afghanistan</b>						
1966-1968	2,170	179	67.5	10.3	29.3	12.4
1969-1971	1,987	158	61.6	9.1	21.6	11.1
1975-1977	1,974	147	60.8	8.4	27.0	10.1
1994-1996	1,706	146	47.1	8.5	26.2	11.0
<b>Myanmar</b>						
1961-1963	1,770	93	45.7	8.2	30.4	5.1
1969-1971	2,040	96	52.6	7.7	33.0	6.9
1979-1981	2,327	108	60.1	8.5	35.5	7.2
1989-1991	2,620	98	65.0	8.2	41.7	6.4
1998-2000	2,823	120	72.6	9.7	45.1	7.8

Notes: Three years averages. – No up-to-date information on Afghanistan and Bhutan.

Sources: FAOSTAT, 10 Dec 2002, except: Afghanistan and Bhutan 1966-68, 1969-71, 1975-77: FAO production yearbook 33.1979, pp. 61-71 und 249-259. -- Afghanistan 1994-1996: FAOSTAT, 15 Apr 1999.

**Table 2: Food production in South Asia 1961-2002, in thousand metric tons**

Country/ years	Rice (paddy)	Wheat	Barley	Maize	Millet	Sorghum	Total
<b>Bangladesh</b>							
1961-63	14,555	39	19	5	39	1	14,658
1971-73	15,964	106	21	2	50	1	16,145
1981-83	21,177	1,052	10	1	66	1	22,307
1991-93	27,312	1,082	10	3	65	1	28,471
2000-02	37,345	1,706	4	10	56	1	39,121
<b>Bhutan</b>							
1961-63	38	5	2	50	3		101
1971-73	48	7	3	65	4		132
1981-83	59	10	4	82	7		167
1991-93	43	6	4	43	7		110
2000-02	48	15	4	63	6		142
<b>India</b>							
1961-63	52,939	11,282	2,796	4,493	7,834	8,992	88,336
1971-73	63,282	24,992	2,580	5,764	9,386	7,928	113,834
1981-83	80,234	38,853	2,051	7,123	10,317	11,578	150,156
1991-93	113,814	56,011	1,615	9,219	9,633	10,773	201,065
2000-02	129,310	72,621	1,431	11,972	9,220	7,461	232,015
<b>Nepal</b>							
1961-63	2,108	137	20	845	65		3,175
1971-73	2,257	243	25	798	136		3,459
1981-83	2,383	553	23	744	119		3,822
1991-93	3,101	788	27	1,235	247		5,398
2000-02	4,170	1,200	31	1,470	278		7,149
<b>Pakistan</b>							
1961-63	1,707	4,003	120	499	385	246	6,960
1971-73	3,523	6,936	101	726	339	331	11,956
1981-83	5,107	11,731	173	983	250	223	18,466
1991-93	5,177	15,469	147	1,200	160	225	22,377
2000-02	6,457	19,443	105	1,666	198	223	28,092
<b>Sri Lanka</b>							
1961-63	999			10	20	1	1,030
1971-73	1,340			16	15	1	1,373
1981-83	2,290			24	15		2,329
1991-93	2,433			32	7		2,471
2000-02	2,783			30	4		2,817
<b>South Asia (SAARC)</b>							
1961-63	74.454	15.603	2.977	6.747	8.411	9.240	117.435
1971-73	88.671	32.284	2.730	7.371	9.930	8.261	150.358
1981-83	113.633	52.199	2.261	8.957	10.774	11.802	201.069
1991-93	154.981	74.144	1.830	12.967	10.366	10.999	265.290
2000-02	184.283	96.185	1.606	16.681	10.040	7.685	316.485
<b>Afghanistan</b>							
1961-63	319	2,168	378	704	20		3,560
1971-73	390	2,355	355	717	30		3,846
1981-83	368	2,389	281	668	31		3,736
1991-93	312	1,772	222	397	22		2,725
2000-02	242	1,918	248	191	21		2,620
<b>Myanmar</b>							
1961-63	7,427	18		65	47		7,564
1971-73	8,045	31		58	39		8,183
1981-83	14,269	124		252	151		14,811
1991-93	14,936	135		201	134		15,419
2000-02	21,708	100		516	170		22,509

Notes: Three years averages, -- Cereals include wheat, rice (*paddy*), barley, maize, rye, oat, millet, sorghum, buck wheat and "others". – Cereal production on the Maldives is negligible, data for Bhutan and Afghanistan not always consistent.

Source: FAOSTAT Database Results (<http://apps.fao.org...>), May 21 2003..

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