

Agriculture and Nutrition in Pakistan: Pathways and Disconnects¹

Mysbah Balagamwala and Haris Gazdar

Abstract Results of the latest nationwide nutrition survey show that the ‘South Asian paradox’ of persistently high rates of undernutrition despite respectable rates of economic growth appears to hold true for Pakistan. Although nutrition has largely been framed as a health issue in Pakistan, it is an outcome of complex processes. Amongst various economic sectors, agriculture – a sector that employs 45 per cent of the workforce in Pakistan – might have direct implications for nutrition outcomes through drivers such as the availability and diversity of food and income distribution. Using evidence from Pakistan, this article reviews trends and policymaking in agriculture and applies a framework for analysing pathways between agriculture and nutrition. It then goes on to highlight potential disconnects in the agriculture–nutrition linkage and identifies areas for future research.

1 State of nutrition in Pakistan

Results of the latest nationwide nutrition survey (NNS 2011) show there to have been no improvements in the state of undernutrition in Pakistan. The proportion of children under five years of age in Pakistan who are stunted is 44 per cent – a 2 per cent increase from the nutrition survey carried out in 2001. A worsening in the state of nutrition has happened despite respectable rates of economic growth in the country – a phenomenon labelled as the ‘South Asian Paradox’ first noticed with respect to India. Other anthropometric indicators such as wasting and underweight are also poor and micronutrient deficiencies among both women and children are high.²

Nutritional outcomes everywhere are driven by a range of factors including availability and consumption of nutritious food, income levels, public health including water, sanitation and hygiene, efficient absorption of food at an individual level, education and knowledge, behaviour and capacity with respect to care. Econometric studies explaining the determinants of nutritional status in Pakistan using a variety of data sources show that Pakistan is no exception to these global patterns.³ Micro-level analyses suggest that household income or wealth has a positive impact on nutrition but that this impact

is not perceptible when community fixed effects are taken into account. These results complement findings from macro-level studies that show that income growth is not sufficient, by itself, to reduce malnutrition.

Among the various economic sectors, agriculture might have the most direct implications for nutrition outcomes through drivers such as food availability and income distribution. While nutrition is an outcome of complex processes, and has come to be framed largely as a health sector concern, a broader range of factors, including food adequacy and quality, are likely to remain relevant in the foreseeable future.

This article proposes a framework for analysing disconnects between growth and nutrition with the focus on agriculture – a sector that employs a large proportion of the workforce and one which, intuitively, ought to have strong nutrition linkages. We provide an overview of agriculture trends and policymaking before setting out our framework for understanding growth–nutrition pathways and disconnects. The article concludes with suggestions for future research.

2 Agricultural trends and policies

In Pakistan, agriculture contributes to over one-fifth of the gross domestic product (GDP)

although its contribution has been declining steadily (Pakistan Ministry of Finance 2011). Labour force participation in agriculture however has declined less sharply and continues to employ 45 per cent of the total workforce, suggesting significant levels of under-employment in agriculture (FBS 2011a).

The structure of the agricultural sector has also experienced changes, with livestock becoming increasingly important and a driver of agricultural growth.⁴ This has implications for food security particularly of the poor as they rely on cereals for a high proportion of their caloric needs (see Table 3). Additionally, cash crops like cotton (a key input in the politically important textile sector) and sugar make up one-fifth of the total value of the sector (PBS 2011b). Some of the regions with consistently low levels of nutrition (such as Sindh and southern Punjab) (NNS 2011; Punjab Planning and Development Department 2009) are also those where the economy is dominated by cash crops such as cotton (Malik 2005).

Although agriculture is seen as an important sector in public rhetoric, policies and programmes relating to agriculture have become increasingly fragmented into special interest issues over time. The major public investments for agricultural growth involved the construction of irrigation infrastructure which led to steady increases in the extent of irrigated areas until the 1970s. Technological changes known as the Green Revolution (introduction of higher-yielding seed varieties and modern inputs) occurred in the 1960s and 1970s. Other related programmes such as extension services have lost their prominence over time, and much of the innovation is routed through markets. Key elements of active policymaking that have influence on agricultural growth and productivity relate to prices, subsidies (including subsidised credit) and taxes – of agricultural produce, inputs and incomes. Other programmes relating to agriculture usually focus on improving water availability, strengthening research systems, agribusiness development and enhancing supply chains through technology improvements. Recent constitutional changes have shifted much of agricultural policymaking to the provincial level of government while retaining some food security-related issues at the federal level.⁵

Agricultural policy, moreover, has not paid explicit attention to nutrition or food consumption until relatively recently. Food security emerged as a priority issue during the food prices hike in 2007–08 and with the realisation that global food prices were likely to remain high and volatile, with strong adverse implications for food security and poverty. A National Task Force on Food Security was set up in 2008 and its report provides a comprehensive and authoritative review of existing policies, and recommendations for the way forward.

One of the most important contributions of the Task Force was to provide a rational basis for the formulation of pricing policy of arguably the most important agricultural product. The government has historically set a floor price for the wheat crop as a way of supporting farmers. Over the decades, however, the government's ability to insulate the national economy from global market prices has declined. Agricultural produce including wheat is exported (often without government sanction) to neighbouring countries at global prices. The Task Force gave formal recognition to these market conditions and proposed that the key objective of a government support price ought to be to guarantee local farmers some level of parity with global market prices. In the past, governments had been willing to use the procurement price to signal low domestic prices in the unrealistic hope that this would depress market prices for urban consumers.

The Task Force marshalled evidence to demonstrate that wheat output responds quickly to price changes, and particularly to anticipate gaps with respect to world prices. The relationship between the price of wheat and its supply in the local markets, therefore, is from price to quantity, rather than the other way round. The Task Force further endorsed the creation of a cash transfer system to protect vulnerable net buyers of food from price inflation and volatility. The most significant policy change with respect to agriculture in recent years, therefore, has been with regard to wheat pricing. Allowing parity with world prices has boosted agricultural growth rates, and has led to increases in rural incomes, while the establishment of a cash transfer system may have protected the consumption of some of the poorest households.

Table 1 Calorie consumption and undernutrition by province

	Calorie consumption 2007–08	Child undernutrition 2011		
		Stunting (%)	Wasting (%)	Underweight (%)
Pakistan	2,408	44	15	32
Punjab	2,435	39	14	30
Sindh	2,164	50	18	41
KPk	2,640	48	17	24
Balochistan	2,439	52	16	40

Source Authors’ calculations from Household Integrated Economic Survey (FBS 2008) and National Nutrition Survey (NNS 2011).

Agricultural growth rates in Pakistan have responded well to price incentives, and recent policy changes have elicited a growth response. This turnaround follows two decades of uneven performance with relatively high growth rates in the 1990s and a slowdown in the early 2000s. With some preconditions for agricultural growth in place, the question about agriculture’s contribution to nutritional improvement gains salience.

3 Pathways between agriculture and nutrition

Even though nutrition is an outcome of complex processes, and has come to be framed largely as a health sector concern, a broader range of factors, including food adequacy and quality, are likely to remain relevant in the foreseeable future (UNICEF framework in Herforth *et al.* 2012). The average daily calorie intake per adult equivalent in Pakistan (2,400 calories) falls within the range of minimum calorie requirement standards but nearly two-fifths of the households consumed less than 2,100kcal/day.⁶ Among the provinces, too, there is great variation with households in Sindh consuming the lowest number of calories. Sindh also has the highest incidence of malnutrition among children in Pakistan. The correspondence between calorie consumption and nutrition does not hold, however, for all provinces and anthropometric indicators as can be seen in Table 1.

Agriculture has a direct impact on household food security through drivers such as food availability and income distribution. The agricultural sector plays an important role in the availability of diverse and nutrition-dense foods.

For agricultural households, the connection between agriculture and nutrition goes a step further with agriculture being a source of income that directly affects nutrition through both food consumption and food absorption. The link between agriculture and nutrition runs both ways as good nutrition – and health – have an impact on the ability to carry out agricultural labour. Time spent on agricultural labour by a woman, too, impacts nutrition as it reduces time for childcare (one of the underlying determinants of a child’s nutritional status) and affects the nutritional requirements of a woman (Herforth *et al.* 2012; Hoddinot 2012).

A systematic review of empirical studies on the relationship between agriculture and nutrition in India was carried out by Gillespie *et al.* (2012) under the research programme Tackling the Agriculture–Nutrition Disconnect in India (TANDI). They used the UNICEF framework to highlight seven distinctive pathways through which agriculture (or agricultural growth) and nutrition could be connected. Empirical studies on India were then grouped under each of the seven pathways in order to draw conclusions about the relative strength and significance of these pathways. We examine each of these seven pathways in the light of existing knowledge of agriculture and nutrition in Pakistan, in order to identify some of the more strategic disconnects for policy intervention.

Pathway 1: Agriculture as a source of food

The TANDI review suggests that in India, growth in grain production is positively associated with nutritional improvement. The evidence is more mixed at the micro-level, however, and the fact that a household was involved in self-cultivation of food was not a guarantee of better nutrition. Many of the farm households were operating at a subsistence level, whereas households with diverse sources of livelihoods (agricultural as well as non-agricultural) were better protected against adverse shocks in food availability.

Developing the TANDI framework further, we believe that this pathway needs to be understood with respect to other sources of food, most notably the market. The assumption is that the implied price of self-consumption is substantially lower than the market price (due to transactions costs and margins), and producers translate this advantage into higher (and perhaps more

Table 2 Calorie consumption by occupation and land ownership status

Occupation and land ownership	% of rural households	Calories/adult equivalent
Agriculture and own land	21	2,709
Agriculture and no own land	25	2,533
Other occupations	55	2,402

Source Authors' calculations from FBS (2008).

diversified) self-consumption. It is also possible that for non-perishable produce (such as grain) producer households can manage their annual or seasonal stocks more easily compared with households who would need to make a large cash outlay (possibly in the face of credit market constraints) in order to acquire annual or seasonal stocks.

Level of calorie intake can also be explained by access to agricultural land. Agricultural households have a higher calorie intake than those who rely on non-agricultural occupations (Table 2). It is not clear whether this difference is due to greater access to cheaper food (through own production) or higher calorific requirements in agricultural work. Within agricultural households, those who owned land consumed on average about 180 calories more than those who did not. The differences in food consumption between households with differential access to land and agricultural self-employment, therefore, will be a promising area of further empirical inquiry in Pakistan.

Pathway 2: Agriculture as a source of income

Increased agricultural productivity leads to income growth among farm households and this, other things being equal, can lead to higher levels of consumption. This pathway, therefore, consists of two stages: from agriculture to household income and from household income to improved food consumption. There is direct evidence for the second stage of this pathway. We find, for example, that calorie consumption and dietary diversity improve as income rises.⁷ Households in the highest income quintile received 43 per cent of their overall calorie intake from cereals compared to 61 per cent of intake by the bottom quintile (Table 3). This is in line with TANDI findings in India, which showed

Table 3 Calorie consumption by household consumption expenditure

Income quintile	Household calories/adult equivalent	Contribution of cereals to household calories (%)
1	2,001	61.0
2	2,249	57.2
3	2,404	54.5
4	2,580	50.8
5	2,807	43.1
Total	2,408	53.3

Source Authors' calculations from FBS (2008).

that the income elasticity of demand for macro- and micro-nutrients was relatively high. The Indian evidence on the link between income growth and nutrition improvement suggests that the largest impacts of growth were observed where income rises were concentrated among the undernourished poor.

The first stage of this pathway – namely the link between agriculture and household income – is mediated by a number of other factors such as access to land and the workings of agricultural labour markets, some which are common to Pathway 1. Unlike Pathway 1, however, this particular pathway does not rely on self-consumption or exclusively on food output. Increased productivity of a cash crop, for example, may lead to higher incomes for agricultural households. It may, conversely, also lead to a relative decline in the area allocated for food crops used for self-consumption. Higher agricultural productivity may raise incomes of farmers as well as agricultural labourers, if these productivity changes are not associated with labour-displacing technologies. Since the agricultural sector is a repository of under-employment as well as poorly paid and unpaid female labour, overall growth in agricultural incomes may imply some level of redistribution towards the poor.

Pathway 3: Supply and demand factors in agriculture that impact household food security

The TANDI review identifies the impact of 'supply and demand factors' on household food security as its third pathway between agricultural growth and nutrition. A number of

specific channels are examined in the literature reviewed by TANDI. Exogenous improvements in supply, presumably through increased productivity, are thought to lower prices and boost demand and consumption. Relative prices of agricultural products will affect households differently, depending on which category they fall into – net producers or net consumers of food. For a household that can be classified as a net producer of food, price increases are favourable as they lead to an increase in income but for a net consumer of food they result in rising food expenditure which may lead to reduced consumption or reduced non-food expenditure. The commercialisation of food production, moreover, is associated with changes in prices and availability. Exogenous changes in tastes are thought to have reduced the consumption of some micronutrient-rich foods.

Some of these linkages between agricultural growth and nutrition – particularly those pertaining to changes in tastes or uses for micronutrient-rich traditional foods – may be relevant to Pakistan. It is important to note, however, that the relationship posited by this pathway between exogenous increases in supply on the one hand and prices on the other, is understood very differently in Pakistan. As we have shown above with regard to the wheat procurement price policy, the prices of most agricultural outputs are closely integrated with world market prices. Local and temporary variations notwithstanding, the price of most foods is determined not only by local supply and demand conditions but by global markets. Policy-driven prices that have anticipated world market prices have encouraged growth in output and rises in rural incomes.

Pathway 4: Non-food expenditure of income derived from agriculture

There are relatively few studies in the TANDI review that link income growth with nutrition improvement through the channel of increased private expenditure on health care. In principle, agricultural growth and higher incomes for farm and agricultural wage labour households may lead to greater expenditure on factors such as health care, water and sanitation that are known, in Pakistan, to contribute to nutritional improvement through better food absorption (Afzal 2012; Mahmood 2001; Ibrahim 1999; Haddad *et al.* 1996; Alderman and Garcia 1992).

This pathway between agricultural growth and nutritional improvement is similar to Pathways 1 and 2 in the sense that it is relevant for those households who directly participate in agricultural production (as farmers or labourers) and are thus potential beneficiaries of agricultural growth.

Pathways 5 to 7: Role of gender through female employment in agriculture and its impact on intra-household allocations, care practices and females' own energy expenditure

Growth-inducing changes in agriculture can increase the demand for and use of women's labour, and this in turn may have positive as well as negative implications for nutrition. A number of studies reviewed under TANDI suggest that female earnings or women's control over household incomes can increase expenditure on food and basic needs. Increased female labour participation in agriculture, either through agricultural growth or through changes in labour markets, can have contradictory effects on nutrition. Some studies in India (reviewed by TANDI) suggest that women's work has a negative impact on care arrangements within households. If women's own dietary needs receive low priority, higher labour participation may lead to lower nutritional health as energy-intensive activity is not fully compensated for with increased food consumption. This appears to be the implication of a number of empirical studies reviewed by TANDI.

In Pakistan there has been a steady increase in the relative size of the female workforce in agriculture. In fact, the main increase in female labour force participation has occurred in agriculture, which is the largest employer of female labour. Women now represent 38 per cent of all agricultural labour, an increase of 16 percentage points since 2002 (PBS 2011a; FBS 2003). Women's work in agriculture includes tasks like harvesting and cotton-picking (which is highly dependent on female labour) as well as taking care of livestock as unpaid workers. Seventy per cent of rural female workers are reported under the 'unpaid family labour' category (PBS 2011a) and it is safe to assume that a majority are involved in agricultural activities. Many of these activities are energy-intensive and may affect a woman's own nutritional status and they are time-consuming, which may reduce time for childcare.

Some of the regions with the worst nutritional outcomes are those where the agricultural

economy does relatively well, but which also rely heavily on cash crops such as cotton that are intensive in the use of female labour. This may support the thesis of the negative link between agriculture and nutrition. There may be opportunities for assessing the importance of the positive linkage (through the impact of women's income on food consumption) by examining the effects of women-focused cash transfers on nutritional outcomes. This can potentially allow an analysis of the impact of women's income alone on nutrition without taking into account the potential adverse effects of reduced childcare time and increased nutritional requirements.

4 Potential disconnects

The TANDI framework is a useful point of departure for an understanding of the agriculture–nutrition link in Pakistan. Progress along any particular pathway between agriculture and nutrition depends on a wide range of intervening processes and conditions. Many of these processes and conditions are located outside the agricultural sector, or indeed any narrowly defined sector. The nature of gender relations, for example, will influence not only the functioning of agricultural and rural markets, but also intra-household allocations of resources, and the quality of care within a household.

We adopt an encompassing approach and identify three types of possible disconnects between agricultural growth and nutritional improvement. First, there is a mismatch between beneficiaries of growth and nutritionally deprived population segments. The mismatch may occur between as well as within households. While agricultural growth may benefit those households which have access to land, it may be the landless or the land-poor who are most nutritionally deprived. Within households, growth in agricultural incomes (and work) might be distributed unequally between men, women and children. Second, existing patterns of behaviour and preferences may be biased against pro-nutrition 'uses' of agricultural growth. Third, the supporting public infrastructure, particularly in health and other social sectors, which is crucial for transforming agricultural growth into improved nutrition, may be compromised by low levels of political priority and/or organisational effectiveness. This approach leads to the identification of four disconnects, discussed in detail below.

Disconnect 1: Access to agricultural land

All but one of the seven pathways identified by TANDI relate exclusively to households that are engaged in agricultural production as farmers or labourers. Agricultural growth can improve food consumption (Pathway 1) and incomes (Pathways 2 and 4) only if the households in question are directly engaged in agricultural livelihoods. Similarly, the discussion of women's employment and its effects on nutrition (Pathways 5 to 7) is relevant only for those households that engaged directly in farming or farm labour. Pathway 3 is the only one that envisages an impact of agricultural growth on the nutrition of non-agricultural households through changes in prices and availability. There is a clear hierarchy between farmers and labourers in terms of income, food security, nutritional status and the effectiveness of the agricultural growth–nutrition improvement linkage. One major disconnect that affects most pathways, therefore, is access to agricultural land and associated labour arrangements.

Less than half (48 per cent) of rural households in Pakistan own any agricultural land and distribution of ownership holdings is highly concentrated. While the top 1 per cent of households ranked in terms of ownership holdings accounted for 30 per cent of the owned area, the bottom 72 per cent (including the landless) had only 6 per cent of the total area (ACO 2003; PCO 1998). Access to land is somewhat less skewed, as some of the landless and those with small ownership holdings rent land from larger landowners. A large proportion of the agricultural workforce consists of casual wage labourers.⁸ This means that most rural households are not directly engaged in self-employment in agriculture, and may not benefit directly from either greater availability or variety of self-produced food, or from increased overall incomes.

Access to land is not only an issue that relates to distribution between households. Land ownership systems are highly patriarchal in Pakistan, and it is the norm for land to be controlled by males rather than females.

Disconnect 2: Patriarchy and unequal gender relations

Another major disconnect that applies across pathways is that relating to unequal gender relations. While women's role as carers (in

Pathways 5 and 6) is seen as a potential link between agricultural growth and nutrition improvement, in fact this link implies that male earners have less regard for nutritional outcomes than their female counterparts. In other words, the gender pathways can also be framed as disconnects.

Gender inequality is conspicuous in virtually all areas of social policy in Pakistan and this presence of highly unequal gender relations is underpinned by patriarchal social norms. Maternal health practices and women's education (through the route of health education and care practices and behaviour) have shown to strongly influence a child's nutritional status (see Aslam and Kingdon 2010). Women's empowerment has been found to influence household expenditure choices in food and other items (Hou 2011). Patriarchy and unequal gender relations can therefore act as disconnects along the other pathways too. Increased food availability through agricultural growth (Pathway 1) might be compromised if intra-household allocations of food are strongly biased against women and children. The same would hold true for Pathways 2 and 4 with respect to increased household incomes through agricultural growth.

Disconnect 3: Behaviour and preferences

The impact of agriculture on undernutrition through improved access to food (Pathway 1), higher incomes (Pathways 2 and 4) and women's engagement in agriculture (Pathways 5 to 7) is mediated through the behaviour and preferences of individuals and households which make choices about food consumption, dietary diversity, care practices and other related options. Better dietary and care practices can lead to significant nutrition benefits even within existing resources.

Disconnect 4: Political priorities and organisational effectiveness

Interventions, policies and programmes outside of agriculture and nutrition – for example in health, education, and water and sanitation – play a crucial role in translating growth into nutritional improvements. The quantity and quality of public investment in these supporting areas depend on political priorities and the government's organisational effectiveness. This disconnect also interacts with Disconnects 1 and 2 in Pakistan – with the former because land inequality is itself an outcome of political

priorities and weak organisational capacity preventing more equal land policies (Gazdar 2011), and with the latter in terms of women's political agency and pro-nutrition public choices.

Strategic implications

The pathways and disconnects we have identified using secondary literature and data cover a wide range of issues in agriculture, nutrition and other sectors. Interaction between various disconnects can be a factor in preventing pro-nutrition reform, but also provides the opportunity for identifying those areas of intervention that might be leveraged for change across sectors. We have noted that nearly all of the pathways identified in Section 3 are affected by inequalities in Pakistan in access to land and in gender relations. Moreover, there are close linkages between issues arising from behaviour and preferences and gender relations. Access to land too needs to be seen from the viewpoint of inter- as well as intra-household distribution of resources. Policy interventions or innovations that imply interaction across some of main disconnects – notably access to land and gender relations – can play a strategic role in addressing agriculture–nutrition disconnects and improving nutritional outcomes. Examples of these include national programmes such as: the Benazir Income Support Programme, which is a targeted cash transfer scheme for women; provincial programmes such as the Sindh Land Grant Programme under which landless women were granted state land; and interventions by non-governmental organisations (NGOs) such as provision of microcredit loans to women for farming activities or kitchen gardening programmes.

5 Way forward: Research agenda

This article began with the premise that economic growth in general and agricultural growth in particular could support nutrition improvement far more strongly than it has done thus far in Pakistan. The adequacy and diversity of food consumption remains an important bottleneck at the household level, and agriculture remains the repository of an under-employed and rapidly feminising workforce. Recent policy reforms aimed at stimulating agriculture appear to have elicited a positive growth response.

Applying a framework developed by TANDI for India, we have analysed key pathways and

disconnects between agriculture and nutrition in the context of Pakistan. The salient disconnects that require further investigation include access to land, gender relations, behaviour and preferences, and political priorities and organisational effectiveness. There are important knowledge gaps in all these areas, and a research agenda that addresses these gaps might play a role in bridging some of the

disconnects that have been identified here. Existing programmes and policies such as cash transfer programmes and land grant schemes that address themes in gender relations and access to land provide opportunities for grounded empirical and policy research. Lessons from such research can contribute to the mainstreaming of nutrition goals in policymaking in agriculture and other sectors.

Notes

- 1 This article is part of the Leveraging Agriculture for Nutrition in South Asia (LANSA) research programme. LANSA is funded by UKAid through the Department for International Development (DFID).
- 2 See NNS (2011) for statistics on various indicators of nutrition in Pakistan.
- 3 See, for example, Iram and Butt (2006); Afzal (2012); Alderman and Garcia (1992); Haddad *et al.* (2002); Ibrahim (1999); Mahmood (2001); Aslam and Kingdon (2010) and World Bank (2002).
- 4 In 2000–01 livestock contributed to 48 per cent of value added in agriculture but now makes

- up 55 per cent of value added (Pakistan Ministry of Finance 2011, PBS 2011c).
- 5 On the opportunities and challenges implied by these changes for nutrition policy see Zaidi *et al.*, this *IDS Bulletin*.
- 6 From authors' calculations based on Pakistan Federal Bureau of Statistics (FBS 2008).
- 7 Total household expenditure/capita is used as a proxy for income.
- 8 Around a sixth of the workforce in agriculture is classified as unskilled by the Pakistan Bureau of Statistics (PBS 2011a).

References

- ACO (2003) *Pakistan Agricultural Census 2000*, Islamabad: Agricultural Census Organization (Pakistan Bureau of Statistics)
- Afzal, U. (2012) *The Determinants of Child Health and Nutritional Status in Punjab: An Economic Analysis*, CREB Working Paper 02-12, Lahore: Centre for Research in Economics and Business
- Alderman, H. and Garcia, M. (1992) *Food Security and Health Security: Explaining the Levels of Nutrition in Pakistan*, Policy Research Working Paper Series 865, Washington DC: World Bank
- Arif, G.M. (2004) 'Child Health and Poverty in Pakistan', *Pakistan Development Review* 43.3: 211–38
- Aslam, M. and Kingdon, G. (2010) *Parental Education and Child Health – Understanding the Pathways of Impact in Pakistan*, CSAE Working Paper Series 2010–16, Oxford: Center for the Study of African Economies
- FBS (2008) *Household Integrated Economic Survey (HIES) 2007–2008*, Islamabad: Federal Bureau of Statistics (Pakistan Bureau of Statistics)
- FBS (2003) *Labour Force Survey 2001–2002*, Islamabad: Federal Bureau of Statistics (Pakistan Bureau of Statistics)
- Gazdar, H. (2011) 'The Fourth Round, and Why They Fight On: The History of Land Reform in Pakistan', in *Leveling the Playing Field: A Survey of Pakistan's Land Reforms*, Kathmandu, Nepal: Panos South Asia
- Gillespie, S.; Harris, J. and Kadiyala, S. (2012) *The Agriculture–Nutrition Disconnect in India: What Do We Know?*, IFPRI Discussion Paper 01187, Washington DC: International Food Policy Research Institute (IFPRI)
- Haddad, L.; Alderman, H.; Appleton, S.; Song, L. and Yohannes, Y. (2002) *Reducing Child Malnutrition: How Far Does Income Growth Take Us?*, FCND Discussion Paper 137, Washington DC: International Food Policy Research Institute (IFPRI)
- Haddad, L.; Bhattarai, S.; Immink, M. and Kumar, S. (1996) *Managing Interactions between Household Food Security and Preschooler Health*, Washington DC: International Food Policy Research Institute (IFPRI)
- Herforth, A.; Jones, A. and Pinstrup-Andersen, P. (2012) *Prioritizing Nutrition in Agriculture and Rural Development: Guiding Principles for Operational Investments*, Health Nutrition and Population Discussion Paper, Washington DC: World Bank
- Hoddinot, J. (2012) 'Agriculture, Health and Nutrition: Towards Conceptualising the Linkages', in S. Fan and R. Pandya-Lorch (eds), *Reshaping Agriculture for Nutrition and Health: An IFPRI 2020 Book*, Washington DC:

- International Food Policy Research Institute (IFPRI)
- Hou, X. (2011) *Women's Decision Making Power and Human Development: Evidence from Pakistan*, World Bank's Policy Research Working Paper Series 5830, Washington DC: World Bank
- Ibrahim, S. (1999) 'Anthropometric Patterns and Correlates of Growth Attainment in Under-five Pakistani Children', *Pakistan Development Review* 38.2: 131–52
- Iram, U. and Butt, M.S. (2006) 'Understanding the Health and Nutritional Status of Children in Pakistan: A Study of the Interaction of Socioeconomic and Environmental Factors', *International Journal of Social Economics* 33.2: 111–31
- Mahmood, M.A. (2001) 'Determinants of Growth Retardation in Pakistani Children under Five Years of Age', *Pakistan Development Review* 40.4: 1009–31
- Malik, S.J. (2005) *Agricultural Growth and Rural Poverty: A Review of the Evidence*, Pakistan Resident Mission Working Paper 2, Islamabad: Asian Development Bank
- NNS (2011) National Nutrition Survey of Pakistan, Islamabad: Government of Pakistan, Aga Khan University and UNICEF
- Pakistan Ministry of Finance (2011) *Economic Survey of Pakistan 2010–2011*, Islamabad: Ministry of Finance
- Pakistan Planning Commission (2009) *Final Report of the Task Force on Food Security*, Islamabad: Planning Commission
- PBS (2011a) *Labour Force Survey 2010–2011*, Islamabad: Pakistan Bureau of Statistics
- PBS (2011b) *Agricultural Statistics of Pakistan 2010–2011*, Islamabad: Pakistan Bureau of Statistics
- PBS (2011c) *Pakistan Statistical Year Book 2011*, Islamabad: Pakistan Bureau of Statistics
- PCO (2000) *1998 Census Report of Pakistan*, Islamabad: Statistics Division, Population Census Organization (Pakistan Bureau of Statistics)
- Punjab Planning and Development Department (2009) *Multiple Indicators Cluster Survey (MICS), Punjab 2007–2008*, Lahore: Planning and Development Department
- World Bank (2002) *Pakistan Poverty Assessment – Poverty in Pakistan: Vulnerabilities, Social Gaps and Rural Dynamics*, 24926-PAK, Islamabad: World Bank