Agriculture and Nutrition in Pakistan – Pathways and Disconnects*

*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).

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This paper summarises existing evidence on nutrition and agriculture in Pakistan with the view of highlighting the main pathways and disconnects between agriculture growth and nutritional improvement.[1] The first two sections (Sections 1 and 2) describe the nutrition and agriculture situations and trends respectively. Section 3 provides a summary of nutrition-related policies and programmes, and Section 4 does the same for agriculture-related policies and programmes. An analysis of the main pathways and disconnects between agricultural growth and nutritional improvement is presented in Sections 5 and 6 and Section 7 concludes the paper and identifies areas for future research.

1. Nutrition Situation and Trends

There are a number of sources of anthropometric data in Pakistan, and the National Nutrition Survey 2011 (NNS 2011) is widely regarded as being among the more authoritative nationally and provincially representative surveys. Besides anthropometric measures for children the NNS 2011 also collected data on adult women's body mass index (BMI) and blood and urine samples for children and adult women to analyse micronutrient adequacy. Apart from its obvious value as a reliable source of information on the current situation, the NNS 2011 has the advantage of comparability with an earlier round of the same survey in 2001 (NNS 2001).

According to NNS 2011, the proportion of children under five years in Pakistan who are stunted, wasted and underweight is 44 per cent, 15 per cent and 32 per cent respectively. The survey finds that since the previous comparable survey (NNS 2001) stunting and wasting rates have worsened and the proportion of children who are underweight has remained the same (Table 1).

Micronutrient deficiency among women and children is also high and has worsened considerably since 2001 (Table 1). More than half of the children in Pakistan suffer from vitamin A deficiency – a figure that has dramatically increased since 2001. Similarly, while only 6 per cent of women were considered vitamin A deficient in 2001, the figure now stands at 42 per cent. These changes are despite the vitamin A supplementation programme that has been on-going for the last few years. Prevalence of anaemia among women has also doubled and now every other woman in Pakistan is considered anaemic. There has, however, been improvement in rates of iodine deficiency from 42 per cent to 12 per cent among children between the ages of 6 and 12 and from 58 per cent to 14 per cent among women in over a period of ten years. This is linked to the success of a large scale initiative of salt fortification with iodine coupled with a nation-wide public awareness campaign.

Serious micronutrient deficiency and worsening of anthropometric indicators in Pakistan are a cause of concern and the problem a large scale one. The country is not on target for meeting Millennium Development Goal 1 (MDG1) which aims to halve the prevalence of underweight children under five

[1]This paper has been written for the Leveraging Agriculture for Nutrition in South Asia (LANSA) research project. LANSA is funded by UKAid through the Department for International Development (DFID).

between 1990 and 2015. [2] In order to meet its MDG1 target, underweight prevalence in Pakistan would have to reduce on average by an unprecedented 3 per cent points annually from 2011 to 2015.

Table 1: Nutrition Indicators in Pakistan (in %)

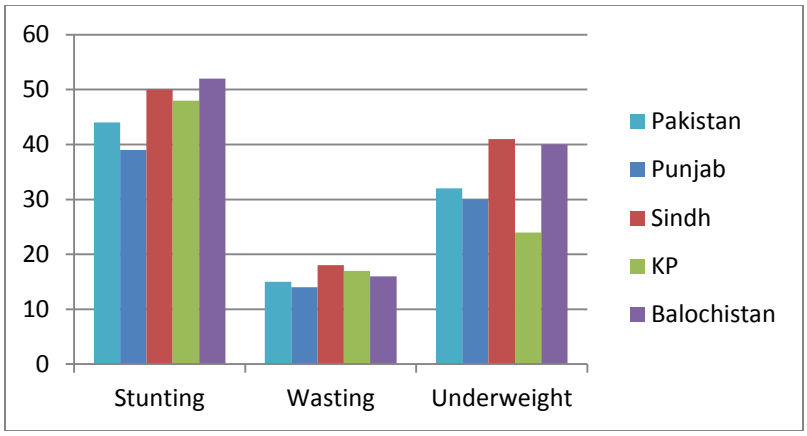
	NNS 2001	NNS 2011
Children under 5 years		
Stunting	42	44
Wasting	14	15
Underweight	32	32
Anaemia	51	63
Vitamin A deficiency	13	54
Zinc deficiency	37	39
Children between 6 - 12 years		
Iodine deficiency	42	12
Mothers (Non-pregnant)		
Underweight (BMI < 18.5)	NA	14
Iodine deficiency	58	14
Anaemia	29	50
Vitamin A deficiency	6	42
Zinc deficiency	42	42

Source: NNS 2011

Disaggregating anthropometric indicators at the provincial level shows that while variation does exist across provinces it is not consistent across different indicators (Figure 1). For example, Khyber Pakhtunkhwa (KP) has the lowest proportion of underweight children but has a higher prevalence of wasted and stunted children compared to the national average. Punjab is better off than the national average for all 3 indicators whereas Sindh and Balochistan have a higher proportion of malnourished children compared to the national average. In both these provinces, every other child under the age of five is stunted implying very high rates of chronic malnutrition.

Figure 1: Anthropometric Indicators by Province

[2] See http://undp.org.pk/goal-1-eradicate-extreme-poverty-and-hunger.html



Source: NNS 2011

The incidence of stunting worsened in all provinces between 2001 and 2011 especially in Balochistan where stunting increased by 9 percentage points (see Table 2). The province also experienced a large increase in the proportion of underweight infants (12 percentage points) and went from being the province with the lowest rates of underweight children to just one percentage point less than the highest (Sindh). The prevalence of wasting, however, declined in Balochistan as well as in Sindh but increased by 4 percentage points or 30 per cent in KP. At the same time, the proportion of underweight children in KP declined from 31 per cent to 24 per cent.

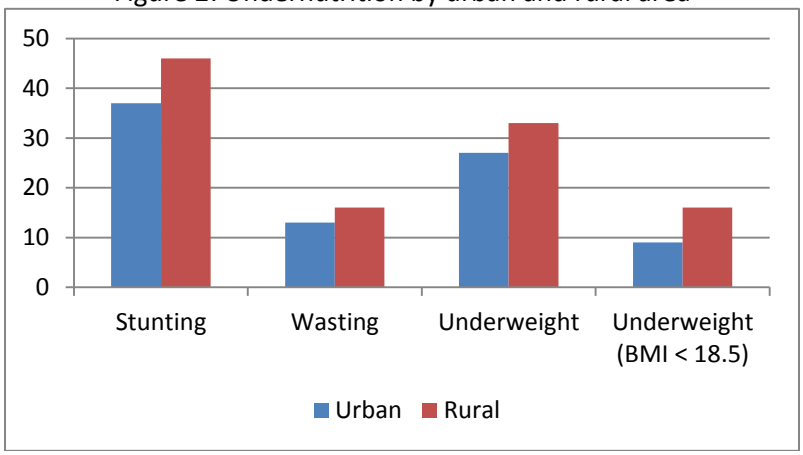
Table 2: Provincial trends in anthropometric indicators

	Stunting		Wasting		Underweight	
	2001	2011	2001	2011	2001	2011
Punjab	38	39	13	14	29	30
Sindh	48	50	21	18	42	41
KP	46	48	13	17	31	24
Balochistan	43	52	18	16	28	40

Source: NNS 2011

All anthropometric indicators are worse in rural areas compared to urban areas (Figure 2). Prevalence of stunting, for example, is 9 percentage points higher in rural areas compared to urban locations. Similarly 16 per cent of women residing in rural areas area are underweight as compared to 9 per cent in urban areas.

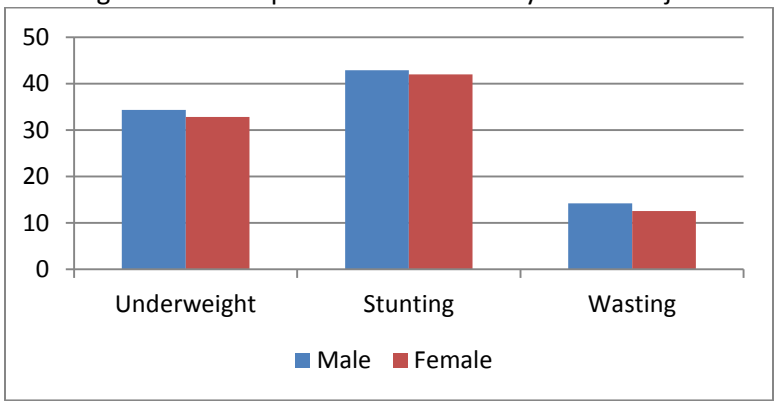
Figure 2: Undernutrition by urban and rural area



Source: NNS 2011

Since the NNS 2011 report does not provide a breakdown of anthropometric indicators by income and sex, data from the Multiple Indicators Cluster Survey (MICS) for Punjab is used. Figure 3 shows that for all anthropometric indicators male children are slightly worse off than female indicating there to be no gender bias in nutritional outcomes in Punjab. Studies using other sources of data also reach a similar conclusion about the rest of Pakistan (e.g. Hazarika, 2000).

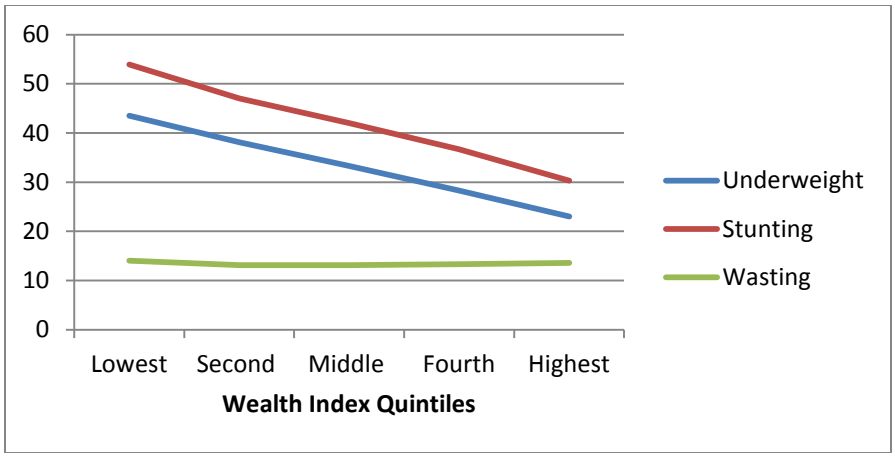
Figure 3: Anthropometric indicators by sex in Punjab



Source: Punjab MICS 2007-08

There is a sharp decline in incidence of underweight and stunted children as income increases (Figure 4). However, there is no variation in wasting across wealth quintiles. While belonging to a wealthier household does reduce the probability of being underweight or stunted for children under 5, even at the highest wealth quintile underweight and stunting prevalence are 23 per cent and 30 per cent respectively.

Figure 4: Anthropometric indicators by wealth in Punjab



Source: Punjab MICS 2007-08

Determinants of nutrition in Pakistan

As seen above, wealth has a link with nutrition but the existence of malnourished children even at high levels of income indicates that there is more to nutritional outcomes than a household's economic status. Several econometric studies using a variety of data sources have been carried out to explain the determinants of nutritional status in Pakistan. [3]

While mother's education is found to be an important factor in determining nutritional outcomes of children (Iram and Butt, 2006; Ibrahim, 1999; Mahmood, 2001; Afzal, 2012; Arif, 2004), the effect is more pronounced in poorer families (Arif, 2004) and is more important than calorie availability (Alderman and Garcia, 1992). However, Aslam and Kingdon (2010) using data from a household survey conducted in KP and Punjab find that mother's education only affects nutritional outcomes of her children through what they label as "pathways" – the impact of maternal education on stunting works through media exposure, health knowledge and participation in labour force while on weight-for-age through level of empowerment. Afzal (2012) also finds that mother's health knowledge positively affects nutrition. Father's education or ability is found to have no impact on nutritional outcomes but positively affectsone-off health decisions such as immunisation (Aslam andKingdon, 2012).

Household income or wealth has a positive impact on nutrition (Iram and Butt, 2006; Afzal, 2012; Alderman and Garcia, 1992; Mahmood, 2001; Haddad et al, 2002) but the impact goes away when community fixed effects are controlled for (World Bank, 2002) indicating that even poor households in wealthy communities can have better nutrition outcomes as there might be better health knowledge or better health access and sanitation systems in richer communities. Moreover, growth in income alone is not sufficient to reduce malnutrition (Haddad et al, 2002) indicating that nutritional outcomes are a result of complex interactions between various factors.

Haddad et al. (1996) find that incidence of diarrhoea plays an important role in worsening weight-for-age Z scores especially at low calorie intake levels. Other studies (Iram and Butt, 2006; Ibrahim, 1999) also find diarrhoea to play an important role in determining nutrition status. Sanitation facilities (Ibrahim, 1999; Mahmood 2001; Afzal 2012; Alderman and Garcia, 1992) and healthcare practices

[3] See, for example, Iram and Butt (2006); Afzal (2012); Alderman and Garcia (1992); Arif (2004); Haddad et al. (2002); Ibrahim (1999); Mahmood (2001); Aslam and Kingdon (2010) and World Bank (2002).

(Mahmood 2001; Alderman and Garcia, 1992) have also been to found be positively related to lower levels of malnutrition. Afzal (2012) however finds hygiene practices do not matter but sanitation facilities do.

Summing up

Not only are there high levels of malnutrition and micronutrient deficiency in Pakistan but there has been a lack of improvement in nutritional outcomes. Nutritional outcomes are correlated with income and food consumption, but also depend on a range of other factors such as health, disease and water and sanitation conditions. The results of the latest nutrition survey which showed no improvement in nutrition indicators have highlighted the urgency of making nutrition improvement an important agenda in future social policy planning in Pakistan.

2. Agriculture Situation and Trends

Agriculture's contribution to national income has been declining steadily, and it currently accounts for just over a fifth of the gross domestic product. Its share of the workforce has declined less sharply and it continues to employ around 45% of the total workforce, suggesting significant levels of under-employment in agriculture (Table 3).

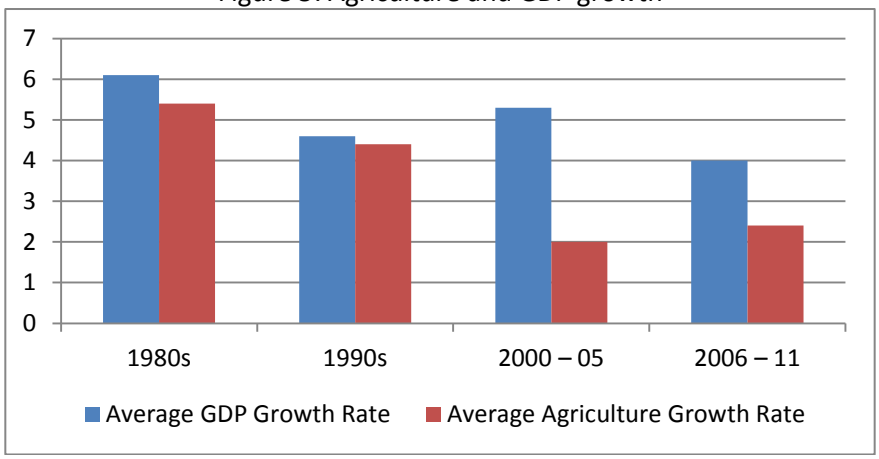
Table3: Share of agriculture in GDP and labour force

Year	Agriculture in GDP (%)	Labour force in Agriculture (%)
		Overall
1995 – 96	26.1	46.8
1999 – 00	25.9	48.4
2003 – 04	22.9	43.1
2007 – 08	21.3	44.7
2010 – 11	21.2	44.9

Source: Economic Survey of Pakistan, various; Labour Force Survey, various

A comparison of overall economic growth rate with the rate of growth in agriculture shows that agriculture has grown slowly compared with the GDP (Figure 5). Agricultural growth rates declined in all periods since the 1980s except for the last five years which witnessed a small improvement in growth rates over the previous half decade. The gap between agricultural and GDP growth rates was particularly high between 2000 and 2005 which was a period of relatively high GDP growth – agriculture recorded its lowest growth in this very period.

Figure 5: Agriculture and GDP growth



Source: Economic Survey of Pakistan, various

The composition of value added in agriculture has changed considerably over time with livestock becoming increasingly important within the agriculture sector. In 2000-01 livestock contributed to 48 per cent of value added in agriculture but now makes up 55 per cent of value added (Table 4). These figures suggest that the livestock sub-sector has emerged as a major driver of agricultural growth. This is likely to have implications for the contribution of agricultural growth to household level food security, particularly of the poor who continue to rely on cereals for a high proportion of their caloric needs. Also relevant, is the position of various crops within the cropping sub-sector (Table 5). Cash crops such as cotton and sugar account for over a fifth of the total value in the crop sector – the former is particularly important as it supports a politically-important textile sector.

Table4: Contribution of sub-sectors to value added in agriculture (per cent)

	2000-01	2003 - 04	2006 - 07	2009 - 10	2011 - 12
Major Crops	34.1	34.1	35.2	32.9	31.8
Minor Crops	13.5	12.7	11.0	10.3	10.0
Livestock	47.9	48.9	50.7	54.0	55.0
Fishing	1.6	1.3	1.8	1.9	1.9
Forestry	2.8	2.6	1.4	1.4	0.9

Source: Economic Survey of Pakistan 2011-12; Pakistan Statistical Yearbook 2010

Table5: Value of selected crops in total crop value (per cent)

	2000-01	2003-04	2006 - 07	2010 - 11
Wheat	25.5	24.9	25.9	27.3
Rice	9.9	10.8	10.4	9.1
Cotton	15.7	14.1	15.6	14.4
Sugarcane	7.1	8.3	7.4	7.6
Fruits, Vegetables & Condiments	17.4	15.4	14.5	16.9

Source: Authors' calculations based on Agricultural Statistics of Pakistan 2004-05 & 2010-11

Pakistan's agricultural sector (including its livestock, horticultural and orchard sub-sectors) have a high degree of reliance on canal-based irrigation. Around 96 per cent of the total wheat crop of 23 million tonnes, which is the main staple in the country, was produced on irrigated land. The most productive agriculture is on the 82 per cent of the cultivated area which is irrigated, and government canals account for nearly three-quarters of the irrigated area (Pakistan Bureau of Statistics, 2011).The distinction between irrigated and unirrigated areas is a key marker of agricultural productivity and barring exceptions of some districts with high levels of non-agricultural employment and out migration in northern Punjab, unirrigated areas rank among the poorest and most environmental regions of the country. The economy of these regions, particularly in southern Punjab, eastern Sindh, and much of Balochistan which rely on rain-fed farming, are vulnerable to rain failures and drought.

Studies measuring the relationship between agricultural growth and poverty date to the 1990s. During that decade the average annual growth rate in agriculture was 4.4%[4] which was above the developing country norm of around 4% (IFPRI & BNU, 2005). Despite high growth rates, rural poverty still increased (Dorosh and Malik, 2006; Malik 2005). Dorosh and Malik (2006) use the IFPRI and PRHS panel data set to show in their sample of 4 districts, between the early 1990s and 2002, net crop income as well as overall income of farm households rose especially for poor farmers. However, rural non-agricultural incomes fell by 30%, possibly accounting for the rise in overall poverty ratios despite positive agricultural growth.

Changes in non-agricultural incomes (including those from remittances and government employment) not only drove poverty trends (despite positive agricultural growth), but their levels are also responsible for inter-regional variations in poverty ratios. Regions with low levels of non-agricultural incomes record higher ratios of rural poverty. This is the case for the cotton/wheat region of rural Pakistan comprising

[4]This growth rate is almost equal to average GDP growth rate in the 1990s of 4.6% per annum According to Malik (2005) this growth rate is a "statistical artifact" (p.25) due to over-reporting growth in value-added in livestock in FY 1996 and forest and fisheries in FY 2000. Adjusted growth rate should be 3.1% per annum.

of a large part of Sindh and certain parts of southern Punjab (Malik, 2005). These also happen to be some of the regions with high levels of undernutrition (NNS 2011 for Sindh, MICS 2007-08 for southern Punjab).[5]

While the proportion of the male workforce which is in agriculture has been declining, agriculture remains steadily the largest employer of women workers (Table 6). This, and the rising female labour participation rate, has meant that women now represent 38 per cent of all workers recorded as agricultural in the 2010-2011 compared with 22 per cent in 2001-2002.The Labour Force Survey also classifies workers by their employment status – and reports the category of 'unpaid family labour' in urban and rural areas. There appears to be a steady feminization of the agricultural workforce, with implications for agriculture-nutrition linkages as shown in later sections.

Table6: Labour force employed in agriculture, by sex

	Male	Female
1999 – 00	43.4	73.7
2003 – 04	37.0	66.6
2007 – 08	35.3	73.8
2010 - 11	34.7	74.2

Source: Pakistan Employment Trends, 2011

Summing up

Even though the share of agriculture in national income is in decline, it still is a key source of livelihood for almost half of the country's workforce. Within agriculture there are various factors such as access to land, land ownership, other income opportunities and geography of the area which determine socio-economic outcomes that can have an impact on nutritional status. Growth in agriculture slowed down in the previous decade compared to the 1980s and the 1990s but evidence shows that even in years of higher growth rate in agriculture, poverty increased highlighting the importance of looking within the agricultural sector to understand disconnects between growth and socio-economic outputs. A number of factors mediate the relationship between agricultural growth and poverty, food consumption and nutrition at the household or individual levels. Even in rural areas non-farm sources of income are important determinants of exit from poverty. A large part of the agricultural workforce consists of casual wage labourers, and there is evidence of increasing feminization of the agricultural workforce.

3. Nutrition-relevant policies, programs and institutional arrangements

This section outlines the major policies and initiatives in place to combat malnutrition through various channels and discusses environmental and administrative changes that have occurred in the recent years which have had an impact in the evolution of nutrition as an important socio-economic outcome. The Ministry of Health (and now the provincial Departments of Health) is the main arm of the government which has been responsible for direct nutrition-related activities but other interventions outside the health department have also taken place that are relevant for nutrition improvements.

[5]Prevalence of underweight children under 5 is 35.7%, 37.2% and 40.9% in Sahiwal, Bahawalpur and Multan divisions respectively compared to 33.6% in Punjab as a whole while 42.9%, 44.4% and 49.6% of children under 5 are stunted in Sahiwal, Bahawalpur and Multan respectively compared to 42.4% in Punjab.

Ministry of Health

National Nutrition Programme

Nutrition as a stand-alone policy priority was recognised only as recently as 2002 by the Government of Pakistan with the establishment of a Nutrition Wing within the Ministry of Health (World Bank). It followed the findings of the National Nutrition Survey of 2001 which was the first nationally representative sample survey of nutrition in 15 years. The Nutrition Wing prepared a National Nutrition Programme under which 2 major interventions were launched:

1. Improvement of Nutrition through Primary Health Care and Nutrition Education/Public Awareness. This initiative was to be delivered by the existing Lady Health Worker (LHW) programme of the health ministry. The LHW programme was originally conceived as a maternal health and family planning outreach intervention based in the national health ministry. It supported over 100,000 women trained in the provision of basic maternal health and family planning advice in the community. Over time the mandate of the programme was increased to incorporate other functions such child immunisation campaigns. The nutrition intervention aimed to improve women and children's nutrition through the supplyof micronutrient supplementation (vitamin A to infants and iron to women), and by raising knowledge and awareness among women about breastfeeding and growth monitoring.The local LHW who already manages an average caseload of 1,000 households was supposed to be main delivery mechanism for this intervention. The intervention was supposed to cover households that are existing clients of the LHWs in the serviced communities.

   While recent evaluations have not been available, an evaluation of the LHW programme carried out in 2007-2008, some 5 years after the launch of the nutrition initiative, provides some evidence on the performance of this component of LHW activities (Oxford Policy Management, 2009). The evaluation found that LHW's were performing well in a number of their designated areas – particularly with regard to the frequency of home visits, and the provision of maternal health and family planning advice. In the nutrition-related interventions, however, the evidence was not encouraging:

   - Child growth monitoring coverage was relatively low compared with other child-focused interventions such as immunisation
   - LHWs role as a conduit of medicines and supplements was particularly weak, and there was no evidence that micronutrient supplementation was actually being provided
   - Although advice on breastfeeding was part of the nutrition intervention, a rigorous impact assessment paradoxically found a negative impact
   - A related knowledge intervention in sanitation and hygiene practices (not formally part of the nutrition intervention) had a relatively low impact compared with behaviour change in core LHW areas such as family planning

2. National Plan of Action for Control of Micronutrient Malnutrition in Pakistan, which was developed with the international organisation Micronutrient Initiative (MI). The main initiatives under this programme involved adding micronutrient supplements into locally produced foods, and are implemented as public-private partnerships with donor support. These initiatives include:

- Salt iodisation: this appears to be successful programme as suggested by the dramatic decline in iodine deficiency reported in the NNS 2011.
- National Wheat Flour Fortification Project – 175 flour mills were included to produce wheat flour fortified with iron and folic acid along with a mass media campaign. The project which began in 2005 is implemented by international NGOs such as GAIN and MI through the flour mills association.[6]Besides introducing supplementation technology and capacity building (including training) the project also provided nutritional supplements in particular areas of the country for limited periods of time. In the Khyber Pakhtunkhwa province MI claim to have reached half a million people with funding from the World Food Programme. These claims could not be verified from independent sources.
- Fortification of cooking fat (ghee) with vitamin A and D – through local manufacturers.
- Provision to households of micronutrient supplement sachets for addition to meals (Sprinkles) initiated in 4 pilot districts. There is no clear information about the delivery mechanism for this intervention, or the scale of actual deliver or its impact.

While the two main components of the National Nutrition Programme appear to address some of the main contemporary concerns in nutrition, there are questions about the overall coherence, ownership, and sustainability of the programme. The information summarised here has been gleaned from a variety of sources, including the health and nutrition chapters of the annual reports of the Planning Commission, assorted NGO websites, and a conference presentation of the Nutrition Wing. The National Nutrition Programme does not have a unified or sustained institutional presence. The various components too are implemented with various degrees of rigour by implementing partners such as the LHW programme, international donors and NGOs.

Other relevant initiatives

Besides the National Nutrition Programme, there are other initiatives in the health ministry which are relevant to nutrition:

- Infant and Young Child Feeding (IYCF) policy in 2007-08 and training of staff of Baby Friendly Hospital Initiative and LHWs
- Establishment of a Reference Food lab for Strengthening of Food Quality Control System

Constitutional changes in 2010 (18th Amendment) which led to the shift of responsibility for health from the federal to the provincial tier of government have led to the dissolution of the national health ministry. Vertical programmes such the LHWs too are in a state of transition to the provinces. All provincial government either have, or are in the process of establishing, Nutrition Cells which are analogous to the Nutrition Wing of the now defunct federal Ministry of Health.

School feeding programmes

Tawana Pakistan Project – This project was a school feeding programme targeting girls in government primary schools in rural areas run by the Ministry of Social Welfare. While the evaluation of the programme showed positive results, the programme was a political failure and was initially suspended then cancelled in 2005 (Pappas et al., 2005). A National School Nutrition Programme was designed and drafted to replace it but was not implemented as it was not approved.

[6] http://www.gainhealth.org/project/pakistan-wheat-flour-fortification-project

The UN World Food Programme (WFP) has also been running a school feeding programme with the support of the Ministry of Education. While this programme has an education focus, it has a nutritional impact. The programme was initially focused on girls and provided take home rations of vegetable oil, but now is targeted in areas affected by conflict and natural disasters and involves the provision of both take home rations and in-school feeding.[7]

Nutrition policy during disasters

Recent natural disasters and conflictshave highlighted the intensity of malnutrition problems in Pakistan but have also provided an opportunity in the form of increased partnerships and creation of new forums. A cluster approach was adopted as part of emergency response first in Khyber Pakhtunkhwa during a conflict-related IDP Crisis in 2008 and then in flood affected areas across the country after the 2010 Indus floods. Thenutrition cluster was an initiative to coordinate the activities of development and relief organisations (including UN agencies and organisations as well as bilateral agencies, and national and international NGOs) with the government's nutrition-related responses in the disaster affected areas. Key activities during the flood were conducting a rapid assessment survey to identify those who were severely malnourished and providing treatment through the Outpatient Therapeutic Feeding Programme(Pakistan Nutrition Cluster Evaluation Team, 2011).

An evaluation of the cluster's organisation and activities found that while at the national level the cluster was adequately staged, at the provincial level operations suffered from high turnovers and capacity weakness. The lack of a nutrition policy and strategy also gave rise to difficulties in execution as did the limited technical expertise on nutrition among NGOs working in the cluster (Pakistan Nutrition Cluster Evaluation Team, 2011).

Pakistan Integrated Nutrition Strategy

After the floods the nutrition cluster evolved into the Nutrition Working Group with the objective of using current partnerships and developing further networks to coordinate nutrition related programmes and pave way for inter-sectoral action by the government to combat malnutrition. The Nutrition Working Group proposed a Pakistan Integrated Nutrition Strategy (PINS), which conceptualises malnutrition as a multi-dimensional issue causes of which include consumption of food, childcare practices, household food insecurity, income, water and sanitation, high fertility rate, low levels of literacy and natural disasters and emergencies.

The proposed strategy outlines 3 broad areas of action:
1. treatment of acute and chronic malnutrition
2. interventions to address the underlying causes of malnutrition
3. leadership, coordination, advocacy, policy, planning and financing

Activities under the first action area involve addressing the immediate causes of malnutrition such as promotion of good childcare practices – through the Infant and Young Child Feeding (IYCF) initiative –as well as hygiene practices, micronutrient supplementation and food fortification as well as treating

[7]Children enrolled in government primary schools in targeted districts are given High Energy Biscuits daily and vegetable oil, conditional on attendance, every two months

malnutrition through the provision of therapeutic foods under the Community based management of acute malnutrition (CMAM) programme.

Under action area 2 interventions focus around food diversification, water and sanitation and health. Some activities under this include provision of seeds and other agricultural inputs to farmers, school feeding programme and provision of safe water containers to CMAM target families.

Lastly, to build institutional capacity to combat malnutrition, the third action area focuses on advocacy for commitment in the government, including nutrition in health care training, developing nutrition monitoring and surveillance systems, and building national capacity to produce Ready to Use Therapeutic Foods (RUTF).

The Nutrition Working Group was focused around federal government stakeholders, and PINS, consequently, is a strategy proposal pegged at the federal level. Constitutional changes (mentioned above)have devolved most of the functions relating to the proposed strategy to provincial governments.A Pakistan Nutrition Development Partners Group has been formed by the World Bank (The SAFANSI Loop 2012). The current focus of this group is to work with the designated Nutrition Cells within the health departments and the Planning and Development departments of provincial governments to develop action plans. The group has developed policy guidelines and has held sessions in each province with stakeholders from various sectors such as nutrition, agriculture, water and sanitation and education to develop a consensus on a multi-sectoral strategy for nutrition.

Community Management of Acute Malnutrition (CMAM)

The CMAM programme is an international programme endorsed by the United Nations with a curative approach to severe acute malnutrition. The programme focuses on providing home-based solutions to treat severe wasting by provision of RUTFs and using facility-based care for only those children with medical complications.Community workers are trained to identify children requiring treatment (WHO/WFP/UNSCN/UNICEF, 2007). The CMAM programme is especially used in emergency contexts, and in Pakistan too, the first programme was started in 2008 in areas affected by monsoon rains in KP and then expanded to camps for conflict-affected Internally Displaced Persons (IDPs) (UNICEF, 2012).

The CMAM programme is driven by UN agencies such as UNICEF, WFP and WHO with support from the government which provides health facilities and medical personnel. As mentioned above the CMAM approach was used during flood relief in 2010 and is an important component of the Pakistan Integrated Nutrition Strategy. An evaluation of the programme in KP finds that while targets set for the programme have been met there still remain coordination issues between various components of the programme run by different institutions. The programme has not been integrated into the health care system and remains an emergency programme implemented by NGOs. The programme is also costly since RUTFs are not produced nationally. Measurement of impact of CMAM has not been carried out since adequate data collection has not been done(UNICEF, 2012).

While this programme might have been successful in treating acute malnutrition during emergency contexts, as a long term strategy the benefit of the programme can be questioned. The programme depends on RUTFs which are an expensive option to combat malnutrition and the focus of the programme is not preventive.

Cash transfers

Pakistan has initiated a large-scale national cash transfer programme aimed at women in poor households (Benazir Income Support Programme or BISP) (Gazdar 2011a). The programme currently reaches 5 million beneficiary families and is estimated to cover 15 per cent of the national population.[8] Although this is not a nutritional programme, its initial justification was in terms of providing food support to food insecure households. The National Food Security Policy (discussed below) had advocated a large-scale income support programme as a way of reducing the impact of price volatility and rises.

The programme is targeted to all adult women (aged 18 and above) in poor households, and households have been selected on the basis of a poverty census which collected data on household characteristics that were used to construct a proxy for income. Beneficiaries receive a monthly cash transfer of 1,000 rupees (just above 10 US dollars). The programme represents two significant institutional innovations in the Pakistan context: first, the primary focuses on women beneficiaries, and second, the development and use of a comprehensive national database of all households for programme implementation. Preliminary results from independent evaluations suggest that the programme is well-targeted. There is some evidence also that the programme has resulted in improved food consumption among beneficiaries.[9] Nutritional interventions are under consideration as part of the possible expansion of BISP into a conditional cash transfer programme.

The fact that the use of database driven cash transfers has been institutionalised to a great extent was seen in the policy response to floods and displacement in 2010 and 2011. Cash transfer programmes were the principle instruments for helping affected populations following on from the relief phase.

Summing up

Although nutrition emerged as an explicit policy objective in 2002, the effectiveness of various initiatives for dealing with nutritional deficits need to be gauged against the stagnation or even regression in nutritional outcomes in the corresponding decade. Nutrition was addressed initially as a health sector programme at the national level. The National Nutrition Programme failed to evolve into an effective or comprehensive intervention, and its activities were limited to supplementing the existing LHW programme and public-private initiatives for food fortification. Engesveen et al. (2009) use government drafted Poverty Reduction Strategy Papers (PRSP), United Nations Development Assistance Framework (UNDAF) documents and the Nutrition Governance score (an index developed by the World Health Organisation tracking nutrition policies and programmes in a country) to assess the commitment to reduction of malnutrition. A review of documents for Pakistan shows there to be a weak response from the government (as seen by PRSP and Nutrition Governance indicators) but a high priority given to nutrition in documents of UN agencies.

The National Integrated Nutrition Strategy which was proposed in 2011 following a series of disaster response initiatives since 2008 is a fresh attempt at formulating nutrition policy, and has little correspondence with the earlier National Nutrition Programme. Both these initiatives, moreover, require to be redefined as a result of constitutional changes which have shifted the relevant sectoral

[8] http://www.bisp.gov.pk/Default.aspx

[9] Unpublished paper on BISP and Poverty presented at a seminar on the "Preliminary Findings of the Pakistan Panel Household Survey" held at PIDE, Islamabad

responsibilities from national to the provincial level of government. In the meanwhile, there has been some progress in addressing food consumption insecurity at the household level through large scale cash transfer programmes.

UNICEF (2012) highlights "programmatic inefficiencies" that have had an impact on reducing malnutrition in Pakistan. In the Departments of Health, there is lack of nutrition expertise, there is no dedicated nutrition department, there are very few universities offering courses in nutrition, there is no nutrition information management system and social programmes do not include improved nutrition as one of their goals.

4. Agriculture policies, programmes and institutional arrangements

Although agriculture is seen as an important sector in public rhetoric, policies and programmes relating to agriculture have become increasing 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 irrigated area 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 policy-making which have influence on agricultural growth and productivity relate to prices, subsidies (including subsidized credit) and taxes – of agricultural produce, inputs and incomes.

National Task Force on Food Security

Food security emerged as a priority issue during the food prices hike in 2007-08 and 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.

The Task Force discussed in detail the need for a revised agricultural policy in light of low agricultural growth rates experienced in the 2000s. It recommends a four per cent agricultural growth rate in order to safeguard sustained food availability. Some of the agriculture-relevant measures proposed in the report include careful monitoring of agricultural prices and terms of trade; improving agricultural market mechanisms including procurement, storage and distribution; capacity building of agricultural policy and research systems; ensuring availability of and access to agricultural credit for small farmers and marginal regions; better water management systems and approving of legislation on plant breeding and seed distribution to incentivise the private sector.

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 decline. 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 lead

to 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.

Outside agriculture, the task force recommended creating a food security index and updating it regularly along with other price indices to monitor food availability in the country. Moreover, the report highlighted the important role social safety nets have in guaranteeing access to food for poor households.

Other agriculture programmes: [10]

Government policy in agriculture is focused on increasing food availability through improvement of crops yields, maintaining food price stability and improving the distribution network of food crops.Recent development projects initiated can be broadly classified into 4 categories:

1. Water availability – Initiatives include on-farm water management projects, barani village development program, canal rehabilitation and improvements projects with the aim of bringing new areas under irrigation and rehabilitating existing resources.

2. Research and extension - These include projects strengthening research systems focusing on development of need seed varieties and improving livestock services and extension programs such as training of farmers on reduced pesticide usage, agribusiness development and diversification programs and village support programs.

3. Procurement and distribution – Major initiatives in this area are the Agriculture Sector Linkages Programme funded by AusAID which focuses on horticulture, livestock and enhancing value chains that benefit the rural poor by creating markets and employment opportunities; supply chain improvement of selected agriculture and livestock projects In Punjaband projects focused on improving shelf life of perishable food items through irradiation technology and establishment of cold chain systems.

4. Crop Maximisation Project - In 1998, the Food and Agriculture Organisation (FAO) piloted a 3 year program in 3 villages called “The Improved Irrigation Technologies, Farm Inputs and Extension Services” aimed at increasing agricultural productivity and income of small farmers as they have a lack of access to inputs, credit and knowledge. Evaluations of the programme were positive which led to the government extending the project to 15 districts between 2003 and 2006 with slightly modified modalities. Farmers were given loans from bank instead of subsidised inputs. However, this was not as successful as expected and thus in 2007, the second phase of the project (Crop Maximisation Project phase II) was launched in which the original model as administered by the FAO was used. The coverage of the programme was across 26 districts covering over a 1000 villages.

[10]For this sub-section annual plans of the Planning Commission, Economic Surveys of Pakistan and websites of various programmes were consulted [e.g. http://operations.ifad.org/web/ifad/operations/country/projects/tags/pakistan; http://asf.org.pk/, http://www.radp.gov.pk/; http://aciar.gov.au/aslp; http://www.agripunjab.gov.pk/; http://www.fao.org/spfs/about-spfs/success-spfs/pakistan/ar/]

Village-level organisations were created through which farmers received training, sales and marketing support and financing(WFP, 2008).

Institutional arrangements:

Agriculture policies, programmes and research were the responsibility of the Ministry of Food, Agriculture and Livestock (MINFAL) at the federal level with implementation of most projects being by provincial level departments of agriculture, food, livestock and fisheries. Post 18th amendment, MINFAL has been devolved with most powers given to provincial governments and some functions initially to other federal ministries and then to the newly created Ministry of Food Security and Research. The mandate of this ministry is to ensure food security, economic coordination and planning with respect to agriculture, maintain agriculture relationships with the international community and standardisation and regulation of agricultural inputs. Autonomous bodies such as the Agricultural Policy Institute (responsible for pricing policies) and PASSCO (for procurement and storage) which were attached with MINFAL now come under the new ministry. Irrigation has a separate department within each province.

Summing up

Agricultural policy in Pakistan has focused on improving productivity on agriculture through increasing output yield by availability of research and extension services and water management systems and by making small farmers productive through credit, technical and marketing support. Procurement and distribution system improvements have also always been highlighted in agricultural initiatives. This revolves around improving storage and transport facilities and methods to ensure food is available in areas outside farming regions. Moreover, agricultural price policy has also been an important policy tool for the public sector. This not only serves as an income support to wheat farmers but also has direct effects on incentives to grow and sell wheat and on price of wheat flour and other related products which influences non-farm (mostly urban) consumption.

In light of the 18th Constitutional Amendment there have been administrative changes in terms of policy making but like nutrition, it puts policy making and implementation at the same level giving rise to opportunities for evolution of agricultural projects. Some policies such as wheat support price are still developed at the national level.

5. 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, Jones and Pinstrup-Andersen 2012). The average daily calorie intake per adult equivalent in Pakistan (2400 calories) falls within the range of minimum calorie requirement standards but nearly two-fifth of the households consumed less than 2100 kcal/day (see Table 7). Among the provinces, too, there is great variation with households in Sindh, consuming the least 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 8.

Table 7: Distribution of calorie consumption

Calories/ adult equivalent	Percent
Under 1000	1
1000 – 1500	8
1500 – 1800	12
1800 – 2100	17
2100 – 2400	18
Above 2400	44

Source: Authors' calculations from Household Integrated Economic Survey 2007-2008

Table 8: 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
KP	2,640	48	17	24
Balochistan	2,439	52	16	40

Source: Authors' calculations from HIES 2007-2008 and NNS 2011

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 which directly affects nutrition through both food consumption and food absorption. The link between agriculture and nutrition runs both ways as good nutrition (and health) has 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 causes of a child's nutritional status) and affects nutritional requirements of a woman (Hoddinot 2012 and Herforth et al. 2012)

A systematic review of empirical studies on the relationship between agriculture and nutrition in India was carried out by Gillespie, Harris and Kadiyala (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 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 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 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 require 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 (see Table 9). 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, that 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.

Table 9: Calorie consumption by occupation and land ownership status

Occupation and land ownership	Per cent of rural households	Calories / adult equivalent
Agriculture & own land	21	2709
Agriculture & no own land	25	2533
Other occupations	55	2402

Source: Authors' calculations from HIES 2007-2008

Pathway 2: Agriculture as 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 (total household expenditure/capita is used as a proxy for income. Households in the highest income quintile received 43 per cent of their overall calories intake from cereals compared to 61 per cent of intake by the bottom quintile (Table 10). This is in line with TANDI findings in India which showed 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 largest impacts of growth were observed where income rises were concentrated among the undernourished poor.

Table 10: Calorie consumption by household consumption expenditure

Income Quintile	HH calories / adult equivalent	Cereals' contribution to household calories (per cent)
1	2001	61.0
2	2249	57.2
3	2404	54.5
4	2580	50.8
5	2807	43.1
Total	2408	53.3

Source: Authors' calculations from HIES 2007-2008

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 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 which 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, increase in prices are favourable as it leads to an increase in income but for a net consumer of food it results 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 (in Section 4) 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 which 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 which 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 which, as shown in Section 1, in Pakistan, contribute to nutritional improvement through better food absorption.

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 female's own energy expenditure

Growth-inducing changes in agriculture can increase the demand 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 with increased food consumption. This appears to be the implication of a number 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 (see Section 2). Women's work in agriculture includes tasks like harvesting and cotton-picking (which are 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 (LFS 2011) 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 is 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 which 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 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 on nutrition while abstracting away from the negative effects through care and women's own food needs.

6. Potential disconnects

The TANDI framework is 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 which are 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 which engaged directly in farming or farm labour. Pathway 3 is the only one which 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 (see Table 11). 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 (around a sixth) consists of casual wage labourers (LFS 2010-11). 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.

Table 11: Land ownership distribution

Size of Holding (in acres)	Per cent of rural households	Per cent of owned area
0 (landless)	52	
Under 1.0	6	1
1.0 - 2.5	13	5
2.5 - 5.0	10	9
5.0 - 12.5	12	24
12.5 - 50	6	32
Above 50	1	30

Source: Authors' calculations based on Agriculture Census 2000 and Population Census 1998

Disconnect 2: Patriarchy and unequal gender relations

Another major disconnect which 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 order 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 knowledge and care practices and behaviour) have shown to strongly influence a child's nutritional status (see Aslam and Kingdon 2010). Women's empowerment has 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 (pathway 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 organizational effectiveness

Interventions, policies and programmes outside of agriculture and nutrition – e.g. 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 in that land inequality is itself an outcome of political priorities and weak

organizational capacity preventing more equal land policies (Gazdar 2011b), 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 which might be leveraged for change across sectors. We have noted that nearly all of the pathways identified in Section 5 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 which 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 was mentioned earlier; provincial programmes such as the Sindh Land Grant Programme under which landless women were granted state land and interventions by NGOs such as provision of microcredit loans to women for farming activities or kitchen gardening programmes.

7. The way forward

This paper has assembled existing evidence on the possible linkages between agricultural growth and nutrition improvement in Pakistan. We have used secondary material, as well as our own analysis of available secondary data, to provide situation analyses of agriculture and nutrition, and the policy environment relating to both sectors. The policy linkages between agriculture and nutrition are currently weak and tenuous, with little evidence of any significant policy or programme which aims to strengthen existing pathways between the two sectors.

Several avenues of opportunity have become apparent in the recent period for nutrition policy in general, and for leveraging agriculture's role in improving nutrition in particular. First, nutrition and food security were recognised as key issues requiring urgent action by policy-makers as well as the general public in the wake of crises such as global food price increases, conflict-related displacement and recent natural disasters. This greater visibility of nutrition and food security in the public and policy realms forms the backdrop for new initiatives on the part of the development community for engaging with government. Second, food security concerns also gave rise to a reformulation of the rationale for agricultural pricing policy, as well as the emergence of national and provincial social protection programmes. These programmes represent institutional innovations which may prove critical in the delivery of nutrition interventions in the future. Finally, constitutional changes have led to the shift in the responsibility for social sectors (including nutrition) from the federal to the provincial level of government. Agricultural policy, by and large, already resided at the provincial level. Constitutional changes open up new possibilities of policy-making and programming on nutrition at the provincial level, as well as for linking nutrition with agriculture.

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 which 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 which addresses these gaps might play a role in bridging some of the disconnects which have been identified here. Existing programmes and policies such as cash transfer programmes and land grant schemes which 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 policy-making in agriculture and other sectors.

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Appendix

List of abbreviations:

BISP – Benazir Income Support Programme
BMI – Body Mass Index
CMAM – Community-based management of acute malnutrition
FAO – Food and Agriculture Organisation
GDP – Gross Domestic Product
HIES – Household Integrated Economic Survey
IYCF – Infant and Young Child Feeding
KP – Khyber Pakhtunkhwa
LFS – Labour Force Survey
LHW – Lady Health Worker
MDG – Millennium Development Goal
MI – Micronutrients Initiative
MICS – Multiple Indicators Cluster Survey
MINFAL – Ministry of Food, Agriculture and Livestock
NNS – National Nutritional Survey
PSLM – Pakistan Social and Living Standards Measurement Survey
RUTF – Ready-to-use therapeutic food
WFP – World Food Programme
WHO – World Health Organisation
UNICEF – United Nations Children's Fund
UNSCN – United Nations System Standing Committee on Nutrition