SET SUPPORTING ECONOMIC TRANSFORMATION

PATHWAYS TO PROSPERITY AND INCLUSIVE JOB CREATION IN NEPAL

Background Paper: Agro-processing sector

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MAIN FINDINGS AND RECOMMENDATIONS

Agro-processing industries represent a significant and important part of Nepal's manufacturing sector. The last manufacturing survey in 2011 suggested that, compared with the general situation of decline seen in manufacturing, the agro-processing sector had fared better and had grown. However, since then, Nepal has witnessed a growing trade deficit in food and beverages and declining exports, which suggest firm growth has failed to keep pace with demand. Representatives from most industries were downbeat about growth in recent years, indicating uneven prospects across different parts of the agro-processing sector.

The majority of firms did not see shortage of skills as a major constraint facing their operations: while this is an issue, it pales in comparison to the more immediate challenges of accessing a power supply and the trade-related problems that are often spurred by domestic and international political crises. Resolving trade barriers is critical to ensuring all agro-processing firms can continue to access imported goods and to encourage exports for firms in key sectors.

Firm interviews suggested the skills in highest demand were mechanical engineering skills that allow engineers to maintain and modify industrial machinery. At present, most firms rely on a small number of foreign technicians for these tasks. While firms are able to identify and recruit these technicians, this often takes considerable effort, and all indicated they would prefer to hire domestic technicians if these existed.

There is a uniform understanding of what needs to be done to address barriers to export-led expansion within the sector, such as in the food quality accreditation system. For example, firms highlighted that training of quality assurance certifiers was critical to success in export markets. Such training should focus on developing the capacity of processing employees and among third-party (private sector) certification agencies.

INTRODUCTION

Background

This Background Paper is part of a larger report exploring inclusive job creation in Nepal. Research into key sectors was commissioned in early 2017 to inform broader analysis of keys trends in labour markets and provide recommendations on which areas interventions in the labour market should target. Key sectors were selected because they had good growth and export prospects and accounted for a substantial share of employment across the country, and/or because they had been targeted for special attention by government, for example through the Nepal Trade Integration Strategy (NTIS). The research into sectors consisted of reviewing literature and conducting surveys with firms. The other sectors reviewed were tourism, light manufacturing and information and communication technology.

The agro-processing sector: Definitions and importance in Nepal

The agro-processing sector covers both large and small firms that carry out intermediate and final processing of produce from agriculture, livestock and fisheries.[1] In Nepal, sub-sectors with the largest number of firms include grain milling (575 firms), bakeries (112 firms), dairying (56 firms) and sugar processing (54 firms) (CBS, 2014b).[2] While some sub-sectors, such as dairy and vegetable oil, have an

[1] Most agro-processing is covered by ISIC Code 15 (manufacture of food and beverages). Depending on the context, it may also include manufacture of tobacco products (code 16), textiles (17), tanning and dressing of leather (19) and wood and paper products (20 and 21) While it is possible to further disaggregate agro-processing into components and provide more circumscribed definitions, in practice 'the boundaries between manufactured and agricultural products are fuzzy and increasingly hard to define with any degree of analytical rigour' (Cramer and Sender, 2015).

[2] See Table A1 in Annex A.

even balance of large and small firms, large firms dominate the noodles, biscuits and sugar processing industries, and small firms dominate the bakery sector (Islam, 2014).

Several processed agricultural products are included in the NTIS. Lightly processed goods include cardamom, ginger, tea, honey lentils and medicinal and aromatic plants; more heavily processed goods include leather, fruit and vegetable juices and instant noodles.[3]

Trends in the agro-processing sector (existing literature)

Nepal's overall manufacturing sector (which includes agro-processing) has seen a steady decline in the past decade. According to the government's Development of Manufacturing Industries in Nepal (DMIN)[4] report, the share of manufacturing in gross domestic product (GDP) declined from 9.0% in 2000/01 to 6.2% in 2012/13 (CBS, 2014a), and recent figures from the Ministry of Finance (MoF) (2016) indicate this declined even further to 5.5% in 2015/16. Reasons cited for this decline include the unfavourable investment environment in the industry sector and inability to create amicable labour relations as expected, coupled with a lack of reliable and regular supply of electricity, prolonged political transition and weakening industrial infrastructure.

However, while the manufacturing sector as a whole declined, the agro-processing portion fared better. The recorded number of food and beverage firms rose from 863 in 2006 to 1,071 in 2011, and the value added by these firms more than doubled, from around NPR 13 billion in 2006 to around NPR 31 billion in 2011. At the time of the last manufacturing survey in 2011, the food and beverage sub-sector was the single largest manufacturing sub-sector, in terms of both number of firms (26.3% of total) and value-added (34%), the latter rising from 22.8% in 1996. Of all industries, noodles, dairying and sugar have showed the most consistent growth (Islam, 2014). The shares of the leather and wood sectors rose slightly too but from small bases. Conversely, the share of textiles and apparel and fur fell from 25.9% in 1996 to 3.8% in 2011 and wearing apparel from 6.3% to 0.5% (CBS, 2014a).

Commentators have expressed concern over this shift in manufacturing, as agro-processing activities are less complex and technology-intensive than other manufacturing sub-sectors (Basnett and Pandey, 2014).

As growth in the manufacturing sector has stagnated, so too has employment.[5] Islam (2014) highlights the lack of structural change towards better jobs in the manufacturing sector. While figures on employment trends in agro-processing over recent years are not available, Islam notes that, since a number of food manufacturing industries are capital-intensive, agro-processing's share of total manufacturing employment is relatively low, at around 11% for large establishments and 25–40% for small establishments. Two of the industries that grew during the 2000s – sugar and noodles – shed labour while growing (ibid.).

Figure 1 illustrates the diversity in firm size and employment in the main agro-processing sub-sectors based on 2010/11 survey data. Grain milling is by far the largest employer, and small firms of between zero and 19 employees account for over half of employment, with firms of between 20 and 49 employees employing another third and very large firms employing only a small portion. This size and structure is fairly unique: other industries employ half the amount and either have a balance of small medium and large employers (e.g. bakeries and distilling plants) or are dominated by larger firms with over 200 employees (e.g. noodles and sugar plants).

As Figure 2 illustrates, operative workers constitute the lion's share of employees across industries. The largest number of technical workers are employed in the grain milling sector; however, dairy processing has the largest share of technical workers as a proportion of its workforce.

[3] Some of these, such as ginger, tea and medicinal plants, have been longstanding priorities; fruit and vegetable juices and instant noodles have been added to the list of priorities in the latest NTIS.

[4] The DMIN report is a joint collaboration of the Central Bureau of Statistics and the UN Industrial Development Organization.

[5] The share of manufacturing increased marginally from 5.8% in 1998/99 to 6.6% in 2008 (CBS, 2008).

Figure 1. Number of employees in Nepal's agro-processing industries by firm size (2011)

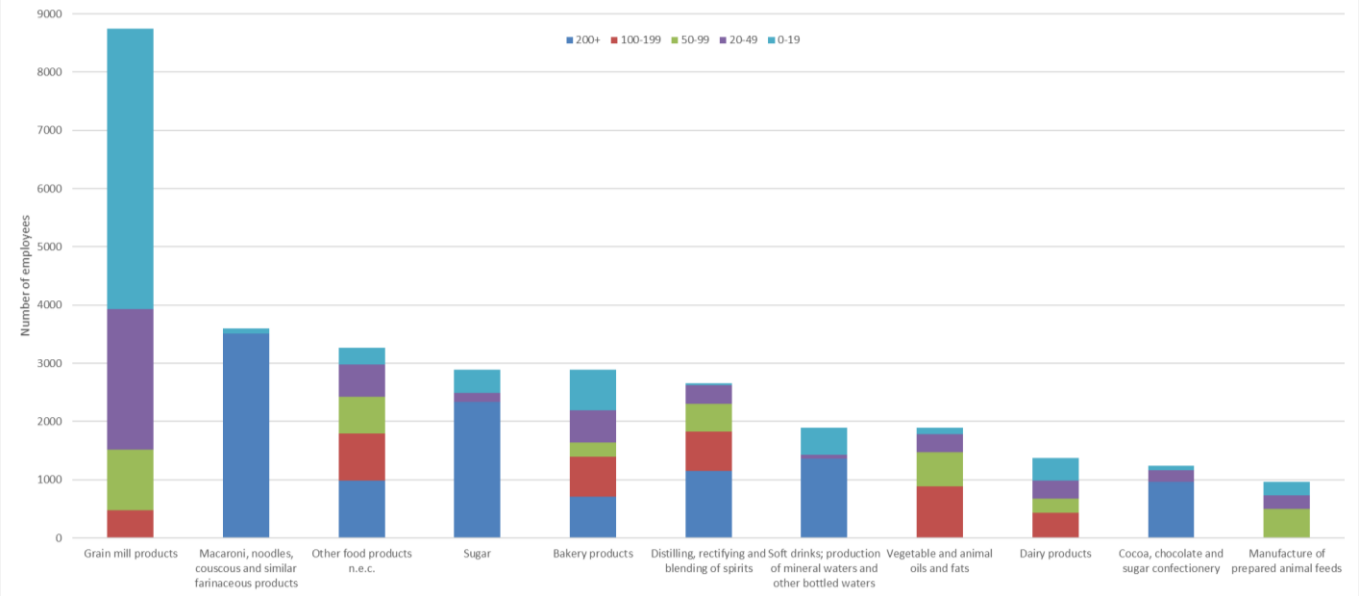
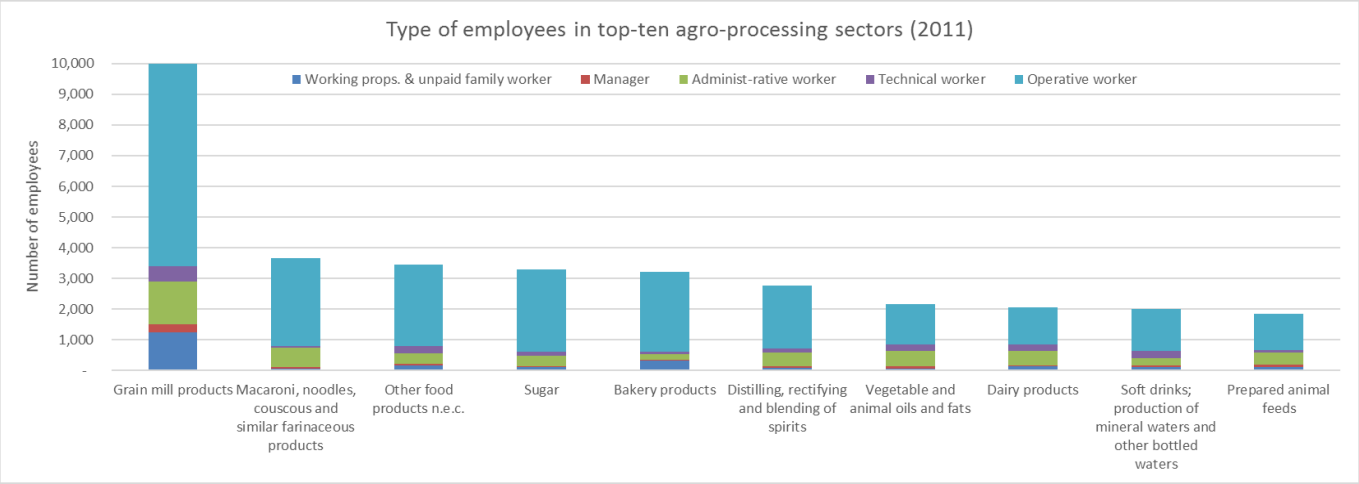


Figure 2. Breakdown of workforce by job category in Nepal's top 10 agro-processing industries (2011)



Note: Figures in columns showing average numbers of workers per firm are derived by dividing the number of workers in each category for the whole subsector by the number of firms in each subsector.

Source: CBS (2014b).

Islam (2014) also points out that the employment intensity of growth in large-scale manufacturing is found to be negative – which is unusual for a country at the stage of development of Nepal currently. In contrast, small-scale industries exhibit positive (albeit rather low) employment intensity of growth (ibid.).

Strong linkages exist between some – but not all – agro-processing firms and Nepal's domestic agriculture sector. Processing of rice, wheat, ginger, spices, tea and coffee has strong backward linkages to domestic traders and the farmers growing these crops. However, other firms rely more heavily on primary products from either neighbouring countries or further afield. For example, the edible oil industry relies almost exclusively on imported processed soy from major global producers. Similarly, the canola oil industry increasingly imports raw materials from major exporters such as Canada, Australia and ex-Commonwealth of Independent States countries.

The DMIN report (CBS, 2014a) suggests the agro-based manufacturing sector stands to benefit from the high costs of importing and exporting goods in Nepal, as this environment offers a form of protection against competition from imports in the domestic market. However, the MoF economic survey reports that

imports of food items and animal products have risen over the past two years (MoF, 2016).[6] Imports of food, beverages and tobacco stand at around NPR 435 billion for the first eight months of 2015/16.

Sales for most agro-processing firms are indeed domestic. This is true for the edible oil sector, animal feed and processed four and rice. Exports are concentrated in a small number food processing firms that produce finished products to export to India – such as Asian-style noodles.[7]

Processed food goods are an increasingly important part of Nepal's overall exports (see Figure A1 in Annex A), However, this expansion is uneven, and the overall value of exports has been falling in recent years (World Bank, 2016). Overall, exports of food and animal products amounted to NPR 9.38 billion for the first eight months of 2015/16, which is the second year of decline (MoF, 2016).

Sector policies that are currently in place

Nepal's manufacturing sector is currently governed by the Industrial Policy 2067, implemented in 2010 to replace that implemented in 1992,[8] which was unable to accelerate the development of industrial sector within the long period that it spanned. The current policy aims to increase industrial activities, expedite employment creation and ramp up income levels. Its salient features include assistance to increase exports of industrial products, development and acquisition of new technologies, promise of a flexible labour policy to promote industrial relations, promotion of industries that use local resources, promotion of green industries, creation of institutions to strengthen industries, protection of industrial intellectual property rights, creation of an investment-friendly regime and promotion of micro enterprises, cottage and small industries. Despite promising features in relation to the acceleration of industrial development, the industrial sector has been declining even since its adoption, most likely because of poor power supply,[9] political unrest, Indian blockades, earthquakes, etc.

The other act that affects the manufacturing sector is the Industrial Enterprises Act 2073 of 2016, which lays down provisions for registration, licensing mechanisms, classification of industries, national priority industries and facilities afforded to different industries. The list of national priority industries includes agro- and forest-based industries. Some of the provisions related to the manufacturing sectors are:

- 100% income tax exemption for the first five years and 50% income tax exemption for the next three years for manufacturing industries established with capital investment of more than NPR 1 billion (equivalent to $9 million) and offering year-round employment to more than 500 Nepalis;
- 25% income tax exemption for manufacturing firms that export (from the income earned through export);
- Income tax exemption for firms depending on the number of employees as well as whether the majority of the workers are women, from disadvantaged groups (Dalits) or disabled;
- No registration fees for small enterprises;
- 35% discount in registration fees for industries owned by women.

Industries processing dairy products, fruit, sugar and vegetable oil also benefit from special tax incentives (e.g. VAT refund for vegetable oil, tax holidays and VAT exemption for capital investments over 2.5 million for fruit processors). Agro-processing industries can also benefit from cheap credit, under a government scheme to provide an interest subsidy on agricultural loans of 5% (Islam, 2014).

Another recent piece of legislation that aims to accelerate industrialisation is the Special Economic Zone Act (SEZA) 2073, of 2016. SEZA aims, among other things, to promote export-oriented industries, increase

[6] How much of this surge is attributable to the impact of the earthquake is unknown.

[7] For Sharda Group, which holds interests in a wide range of agro-processing firms, the only area that is exporting is Asian-style noodles (around 30% of sales). Otherwise, all processed goods (wheat and rice flour and packaged foods) are sold domestically.

[8] The industrial sector's contribution to GDP ironically started declining after its implementation.

[9] The power supply situation has improved substantially recently.

the competitiveness of export-oriented goods and services and attract foreign direct investment (FDI). It makes provisions for industries located in the SEZ to obtain attractive facilities and assistance, including tax holidays like customs duty exemptions, income tax exemptions, VAT exemptions, etc., as well as better access to infrastructure. It also offers attractive foreign currency facilities, Visa facilities and a one window service to create a better environment for attracting FDI.

In terms of employment creation, the National Employment Policy 2071, implemented in 2015, replacing the Labour and Employment Policy 2062 enacted in 2005, is the key policy document governing all sectors. Its primary objectives are to create harmony between various sector-specific policies, improve the quality of the jobs, make the Nepali labour force competitive and strengthen the labour market by increasing the use of a research-based modern information system. Its major policies regarding the development of the manufacturing sector are to promote a one-stop-service system through online services to ease the establishment of industrial services; encourage industries based on local labour; attract FDI in production sub-sectors that have high potential to create productive employment; increase labour productivity; improve industrial relations, etc.

Other relevant policies and laws for the manufacturing sector are those that govern labour market practices. The most important of these are the Labour Act 2048 (1991) and the Labour Rules 2050 (1993). The Labour Act is the main document governing provisions related to labour rights, facilities and safety of workers and employers. This legislation controls the termination of employee services as well as some other provisions, like prohibition of engaging non-Nepali citizens at work[10] (Section 4A); annual increments in remuneration (Section 21A); and prohibition of the deduction of remuneration (Section 24). The Labour Rules complement the Act by laying out rules on security of professions and services; remuneration and welfare provisions; measures relating to health, cleanliness and safety; and provisions relating to committees (labour advisory committees, labour relation committees) and authority (labour officers, factory inspectors, welfare officers).

Other relevant regulations that govern labour market practices and hence are applicable to the manufacturing sector are the Trade Union Act 2049 (1992) and the Trade Union Rules 2050 (1993). The Trade Union Act governs the management of trade unions, including registration and operations, and contains other provisions relevant for the protection and strengthening of professional and occupational rights. The Trade Union Rules lay out the necessary rules for the implementation of the Act. These trade union regulations are often criticised as being a hindrance to manufacturing sector growth, as they allegedly provide excessive power to trade unions to solve labour disputes.

Minimum wage levels in Nepal

The minimum wage level for day wages and salaries in Nepal is negotiated between the Minimum Wage Determination Committee and trade unions, represented by the Joint Trade Union Coordination Centre. In accordance with the 1992 Labour Act, wage levels are reviewed every two years. In 2013, the minimum wage level was NPR 8,000 per month for employees and NPR 318 per day for seasonal workers. For the current year, the minimum salary is NPR 9,700/month, which consists of a salary portion of NPR 6,205/month and a 'dearness allowance' of NPR 3,495. The minimum wage saw growth in real terms of 11% between 2000 and 2013.

	Rate (NPR)		
	2011	2013	2016/17
Basic monthly salary (including dearness allowance)	6,200	8,000	9,700
Daily wage (non-agricultural)		318	395

Source: Ulandssekretariatet (2015).

[10] Foreign workers can be hired only if it is found that a Nepali citizen would not be available for the skilled technical post needed (Section 4A, Article 3, Labour Act 1991).

Survey methodology and framing questions

Our interviews covered grain processing, edible oil, food and feed manufacturing and fibre (jute) processing. While we interviewed firms from most major industries within Nepal's agro-processing sector, we were unable to interview those active in sugar and dairy. Also, although we interviewed a firm manufacturing condiments, we did not include firms specialising in some of the main value chain items that policy and donor initiatives focus on (e.g. ginger, cardamom, tea, coffee). However, several interviewees were able to speak to conditions in some of these sectors as they had interests in these.[11] A majority of the firms interviewed were located in Biratnagar, Morang district.

From a methodological point of view, it is important to note that surveyed firms do not represent a stratified sample of the sector, either in Nepal or within the survey sub-regions, as the final representation is largely composed of firms that responded positively to queries during fieldwork. It is therefore important to note that the survey results should be used as indicative rather than as representing an authoritative view of the sector. As the agro-processing sector encompasses firms that are active in different value chains and rely on different sets of inputs, the survey results should be interpreted as illustrative rather than representative of issues in any particular industry.

One additional point to note is that discussions with a representative from the Morang Chamber of Commerce, who also ran a manufacturing firm producing polymer bags, revealed that the Federation of Nepalese Chambers of Commerce and Industry (FNCCI) had initiated several surveys on skills gaps and needs in recent years.

SURVEY RESULTS

Firm characteristics

Firm's length of operation ranged between 12 and 70+ years, with the youngest firm (producing edible oils) established in 2005 and the oldest (a jute mill) established in 1946.[12] Most of the firms were established in the mid-1990s and early 2000s after Nepal's liberalisation.

Firms' expansion plans depend partly on the economic conditions they face in their individual sub-sectors, which vary substantially. According to one respondent with commercial interests in a number of agro-processing industries, the only major sub-sector where medium-term growth is positive is manufacturing finished food products such as noodles and biscuits, validating findings from the 2011 manufacturing survey (Islam, 2014). This owes partly to the long-term stagnation of the farming sector, which has limited the growth of mills producing intermediary goods, as these have been unable to source inputs to meet their capacity from the (lower-cost) domestic market.[13]

Only two firms in the survey export their goods. Asian Thai Foods exports noodles to the Indian market; Rijal Tashi exports small quantities of sauces and condiments to Western markets. Firms that currently do not export are largely not in a position to start: either they are prioritising unfulfilled domestic demand or high production costs constrain their competitiveness and place export prospects beyond reach. Indeed, only Asian Thai Foods has firm and ambitious expansion plans, which include setting up a new plant in the SEZ and increasing sales within the domestic market and overseas.

[11] A representative from the Federation of Nepalese Chambers of Commerce and Industry (FNCCI's) Agro-Processing Centre confirmed that the broad set of challenges and skills issues identified were relevant to other processing sectors, including tea, ginger and meat processing.

[12] Jute processing is one of Nepal's oldest processing sectors and was previously a major employer and important source of foreign currency.

[13] According to the commentator, maize is the only crop that has seen an increase in acreage: wheat and rice have all seen declines in planting and this has meant food processing plants have had to increasingly rely on inputs from India and third countries. This is confirmed in the latest World Bank Country Economic Memorandum (World Bank, 2017).

The outlook faced by the jute industry is particularly bleak. A combination of stagnation in domestic production coupled with problems in electricity supply and at the borders has eroded the sector's competitiveness and led to job losses: eight of the Nepal's twelve jute processors have closed their gates in recent years. Correspondingly, neither jute processor interviewed had growth plans and instead anticipated that under current conditions they would have to close down in the future.

Nepal's jute sector: A sunset agro-processing industry

Nepal's jute sector illustrates some of the major challenges labour-intensive agro-processing industries face. Previously a major employer and important source of revenue in Nepal, jute production has declined in recent decades, and only four of twelve factories are currently in operation. These operate at around three quarters of their capacity, according to our interviews.

The decline of the industry has been characterised by shrinking domestic jute production, difficulties in importing jute to substitute domestic production and a decline in competitiveness *vis-à-vis* neighbouring South Asian producers. In the mid-1990s Nepal produced 150,000 tonnes per year from 56,000 ha. At present, it produces a little over a tenth of this (17,000 tonnes) on 11,000 ha. As firms now import more than half of the raw jute they process and the cost of raw materials has increased, they have to compete more directly with producers in India and Bangladesh. In recent years, these countries have been offering more support to their own firms, and Nepali firms complained labour in India was also subsidised through food rations and other benefits provided by the government, which have helped keep their wage bills low.

Reasons given for the decline of the processing sector on the domestic side include the power situation and labour issues. As jute processing requires high amounts of labour and machinery, disruptions in power and labour take a heavy toll on production. While the government of Nepal previously recognised the jute industry as a strategically important industry and provided it with subsidised electricity, this was terminated in 2015.

In addition, recent measures taken by the government of India to impose an import tax on all Nepali jute is having a particular severe impact on the industry, and most producers stopped exports in late 2016 and only recommenced in early 2017, paying the tax 'under protest'. Firms suggested that if present conditions were to remain they would have to shut their doors in the near future, prompting further job losses.

Source: The Kathmandu Post (2016).

The smallest firm interviewed had a workforce of 60 and the largest around 3,200. In all firms, the largest number of workers comprises 'operative workers', who do not require a set of technical skills to perform their tasks.

While all firms employ workers on a permanent basis, in all firms temporary labourers form the lion's share of the workforce. In the two jute mills (the largest employers) around 85% of workers were temporary; although others employed a high proportion of permanent workers, these still made up at the most a third of the workforce. As discussed above, as the labour law does not prevent firms from employing workers on a rolling temporary basis, there is little incentive for them to increase the proportion of their staff they hire permanently.

Firms hire small numbers of technical staff (technical operators) to maintain machinery or for quality control and testing of food products (i.e. food safety). Most firms employ fewer than 10 technical staff, with smaller firms employing fewer still.

We discuss the tightness and skills issues for each of these two groups separately below. Despite prompting, firms did not discuss supervisory and senior management levels of staff in discussions about difficulties in recruiting and retaining staff or in terms of particular skills shortages or training needs. Respondents felt hiring and retaining administrative staff was not problematic, suggesting availability of skilled workers in this area was not a problem either.

Labour-related constraints

Operative workers

Responses on the severity of labour-related constraints for operative workers varied. Although some respondents claimed it was generally harder to come by labourers and wage costs were rising, no firm cited difficulties in filling temporary or permanent positions for unskilled workers. While several firms complained the government-set minimum wage they paid workers had been rising quickly over recent years, no firms said it was too high or that they faced difficulties paying minimum wages.

Several firms noted that their workforce was becoming increasingly feminised as more women entered the workforce and because male labourers were scarcer. This increasingly female share of the workforce probably cannot be interpreted solely as an indicator of labour scarcity, however, as a number of firms said they now preferred to hire women. Reasons given included higher efficiency in completing the tasks they were asked to do, higher ability in some tasks (e.g. food preparation) and lower levels of interest in participating in trade unions and industrial action.

Managers at a number of firms also reported that the workforce was ageing. Again, while this is likely partly a result of firms preferring to retain more experienced workers, it may also reflect difficulties in hiring and retaining younger workers, who increasingly prefer to seek employment overseas.

Technical (skilled) workers

Requirements for technical workers vary by firm but the three most frequently cited as necessary were **mechanical engineering**, **chemical engineering** and **food safety**. For food manufacturing firms, there is an urgent need to improve training on food safety to reduce barriers to firms becoming demonstrably compliant with food standards. As compliance with Hazard Analysis Critical Control Point is increasingly required within the food supply chain in Nepal, there will be greater demand for trained staff to test composition of foods and prove compliance.

The skillset that interviewed firms struggle to come by the most relates to installing and setting up machinery. Seven of the eleven firms interviewed hire workers with these skills from India. One of the firms with stronger growth prospects – Kwality Biscuits – also hires chemical engineers involved in food processing from India but otherwise firms rely on domestic workers to perform these tasks.

The majority of firms did not see a shortage of skills as a major constraint facing their operations: while this is an issue, it pales in comparison with the more immediate challenges of accessing a power supply and trade-related problems often spurred by domestic and international political crises. The one exception is Kwality Biscuits, whose manager found it particularly difficult to find workers with mechanical and chemical engineering skills who were able to run machinery.

Demand for different types of training

University and vocational training: While some firms require diplomas and degrees in their areas of expertise in engineering and food safety, they did not feel there were major issues with the current provision of tertiary education.

Firm-based training: Almost all firms provide all their training on the job. Firms highlighted that, even if they hired staff with academic qualifications, they needed to provide on-the-job training to staff. The amount of training provided differs substantially across firms and for different types of staff. Most firms that need to train machinery operators in mechanical engineering provide around six months of training. The mode of training provision is usually sending senior engineers to install machinery to provide training to staff on how to operate it.

Government-provided training: For training on food safety and standards, the Department of Food Technology and Quality Control (DFTQC) also provides training courses on several occasions a year. For

example, in 2012,[14] DFTQC offered 25 programmes that trained 500 people in total. None of the firms mentioned having sent staff to these, and discussions with the FNCCI suggested these were geared more towards government officials. This approach (training government officials) was regarded as inappropriate, given the regular redeployment of government staff in new departments and the need to constantly retrain new staff.

Non-skills constraints

Firms listed a number of constraints that inhibited growth or were undermining existing levels of production. The key issue for almost firms was the lack of regular power. The frequency of power shortages, their unpredictably and the costs of running a plant on expensive alternative power supply all contribute to high production costs and lack of efficiency, according to firm owners. The only firm that did not see this as a problem (Nimbus) relied heavily on alternative sources of power.

Trade issues were also cited as an important source of costs and a constraint to expansion by a substantial number of companies. Firms that process imported goods complained of high import taxes on inputs that erode their competitiveness *vis-à-vis* Indian firms that export finished products. For companies manufacturing food products (biscuits and noodles), a further constraint to exports is the lack of domestic food safety infrastructure, including an accredited food-testing laboratory to which they can send products to demonstrate compliance with food safety standards. Disruption to production resulting from industrial action by trade unions was cited on several occasions but the severity of this differed across firms.

CONCLUSION: POLICY PRIORITIES

For the set of agro-processing firms interviewed (large and with good access to credit), it is likely that future growth will be more capital- than labour-intensive: as firms face higher labour costs, their growth plans include more automisation. However, as long as the investment environment is conducive to growth, firms will likely demand more skilled workers as they expand. This suggests an opportunity in the medium term to replace the cadre of Indian skilled mechanics that firms hire with domestic hires. In the medium term, the growing middle class's demand for processed foods that meet safety standards will likely create more jobs in food safety.

- **Explore working with firms to formalise existing – and provide more – on-the-job training:** Most firms consider on-the-job training the most important way for workers to acquire the skills they need in their jobs. They value formal training less, because in their experience they still need to augment the technical education employees have received by providing skills specific to the firm or the tasks. However, only a handful of the firms interviewed have structured training programmes. These tend to be expensive as they rely on seconded technicians and consultants. For firms that are unable to afford the expenses associated with training programmes, it would be worth exploring the possibility of subsidising training costs, or providing sector-specific training that employees in smaller firms can benefit from.
- **Explore providing joint training that benefits multiple firms:** At present, most firms offer in-house training only for their technical workers. While this allows firms to tailor this to their own needs, it is likely limited to the specific needs of firms at the time of training and to be relatively costly. Supporting existing efforts to provide industry-wide and industry-led training in local training institutes may provide opportunities for staff in smaller firms to benefit from training. Areas of training that would benefit agro-processing firms include engineering and food quality and safety – see below.
- **Extend training opportunities to both young and older workers:** While it may be attractive to prioritise training for youth, both data on the number of youth employed in firms and interviews with managers suggested this might not be sufficient to incentivise youth to stay. Some firms were reluctant to employ youth as they felt they would leave and emigrate when presented with the opportunity. As the average age of workers is rising and older workers are more likely to stay with

[14] This is the latest year for which an annual report is available on the DFTQC website.

firms for longer, it would be worthwhile exploring the opportunities to upgrade skills among older workers. This would raise the likelihood of firms reaping any investment in staff training and incentivise them to invest more.

- **Explore organising trainings specifically for women:** In the same way that the average worker is getting older, workers are now increasingly likely to be female. However, technical workers in firms still tend to be men, and without training specifically targeted at women it is unlikely women will be able to take on more technical and better-paid positions. It would be worth trialling courses on more technical areas targeted mainly at women and minimising barriers to women's participation in courses to raise both recognised qualifications and expertise.
- **At the same time, explore options for providing technical and vocational training in Nepal and sponsoring positions for training in India:** While it will make sense to provide Nepal-based training in some of those areas where there is cross-sectoral demand for skills, for areas where firm- or sub-sector-specific skills are required a more cost-effective route may be to sponsor employees to receive training in India. Much larger Indian industries and training facilities are likely to offer a better learning environment for learning practical skills than in Nepal, where a paucity of practical experience opportunities may mean course contents are overly theoretical.

Difficulty finding skilled workers is a second order constraint. On the basis of the interviews, agro-processing firms do not appear to face a substantial skills gap that hinders their plans to grow their business. While a small share of the firms find it difficult to hire highly skilled technicians, this was not nearly as important as other constraints facing the sector – namely, access to power, roads and – for those firms that rely heavily on imports and exports – trade disputes that disrupt shipments.

- **Improve power and transport infrastructure to promote firms' growth:** The major constraints most firms cited as barriers to growth were poor access to electricity and poor infrastructure. The irregular supply of electricity holds up production and leads firms to spend more on alternative sources of energy. This contributes to putting them at a disadvantage *vis-à-vis* Indian competitors. Interviewees suggested that, with access to a better power supply, they could become more competitive and gain more market share.
- **A substantial share of firms aim to automatise production more in the future:** A significant number of respondents talked about automatising more as part of their growth plan. Reasons include the sense that hiring workers is going to become more difficult and expensive (reflecting the rising trend in the minimum wage) and difficulties with labour and trade unions. As access to credit is not a barrier for most firms, they expected to be able to fund machinery purchases in the coming years. While it was not possible in this research to analyse whether growth with automatisation within different agro-processing subsectors will raise or reduce aggregate demand for labour, this would be worth unpicking in future research to identify the prospects for labour demand in coming years under scenarios of greater automatisation.

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ANNEX A

Table A1. Firms interviewed for this report (January 2017)

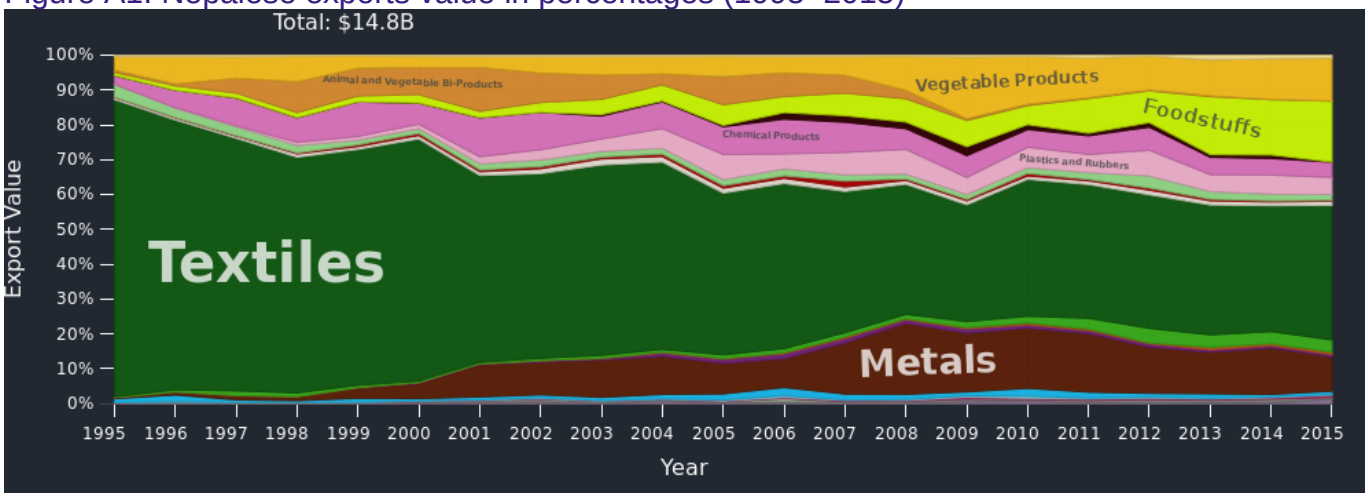
Sub-sector	Location	Firm name
Fruit and vegetable processing	Biratnagar	Druk/ Rijal Tashi Industries Pvt.
Grain processing; oil pressing	Biratnagar	Chandra Shiva Rice & Oil Mill
Jute processing	Biratnagar	Swastik Jute Mills
Processing edible oil (soybean oil; sunflower oil)	Biratnagar	Bagmati Oil
Food processing – noodles	Biratnagar	Asian Thai Foods
Food processing – multiple products	Biratnagar	Sharda Group
Leather tannery	Biratnagar	Asian Leather Industries Pvt. Ltd.
Animal feed; edible oil	Kathmandu	Nimbus
Jute processing	Biratnagar	Raghupathi Jute Mills
Food processing – biscuits	Biratnagar	Kwality Biscuits
Rice and grain processing; oil mills	Biratnagar	Bohara Group

Table A2. Number of agro-processing firms by subsector (2011/12)

NSIC code	Activity	Number of registered firms (2011/12)
1010	Processing and preserving of meat	3
1030	Processing and preserving of fruit and vegetables	7
1040	Manufacture of vegetable and animal oils and fats	36
1050	Manufacture of dairy products	56
1061	Manufacture of grain mill products	575
1071	Manufacture of bakery products	112
1072	Manufacture of sugar	54
1073	Manufacture of cocoa, chocolate and sugar confectionery	17
1074	Manufacture of macaroni, noodles, couscous and similar farinaceous products	16
1079	Manufacture of other food products n.e.c.	67
1080	Manufacture of prepared animal feeds	40

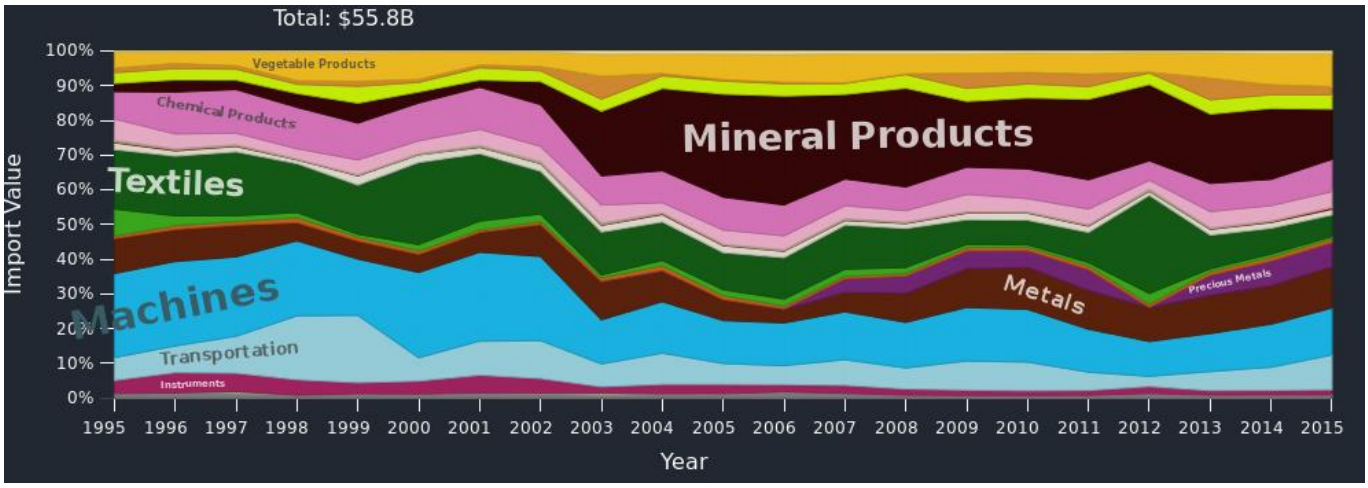
Source: CBS (2014b).

Figure A1. Nepalese exports value in percentages (1995–2015)



Source: OEC compilation of HS2, based on export data from 1995–2015.

Figure A2. Nepalese imports in percentages (1995–2015)



Source: OEC compilation of HS2, based on import data from 1995–2015.

Figure A3. Manufacturing firms' perceptions of positive and negative factors in the business environment (2011)