SET SUPPORTING ECONOMIC TRANSFORMATION

PATHWAYS TO PROSPERITY AND INCLUSIVE JOB CREATION IN NEPAL

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CONTENTS

ACRONYMS

ADB	Asian Development Bank
CBS	Central Bureau of Statistics
CTVET	Council for Technical Education and Vocational Training
Danida	Danish Agency for International Development
EGS	Employment Guarantee Scheme
EU	European Union
EVI	Economic Vulnerability Index
GDP	Gross Domestic Product
GIFF	Growth Identification and Facilitation Framework
GNI	Gross National Income
GoN	Government of Nepal
GVA	Gross Value-Added
HAI	Human Assets Index
ICT	Information and Communication Technology
ILO	International Labour Organization
LDC	Least Developed Country
LMIC	Lower-Middle-Income Country
MCC	Millennium Challenge Corporation
MIC	Middle-Income Country
MoF	Ministry of Finance
NPC	National Planning Commission
NPR	Nepalese Rupee
NTIS	Nepal Trade Integration Strategy
ODI	Overseas Development Institute
PPP	Purchasing Power Parity
RCA	Revealed Comparative Advantage
SDG	Sustainable Development Goal
SWOT	Strengths, Weaknesses, Opportunities, Threats
UN	United Nations
US	United States
WDI	World Development Indicators
WESO	World Employment and Social Outlook
WPP	World Population Prospects

EXECUTIVE SUMMARY

Building a consensus view of how Nepal can transform and create jobs in the future is crucial to incentivise policy action. Unfortunately, at present, there seems to be no unifying, practical vision on how the country can transform (and reach higher income levels) and create jobs. There also seems to be no political debate on job creation. This paper examines credible pathways to prosperity and inclusive job creation from a scenario perspective. It discusses the type of sectors that help grow and transform Nepal and what implications different sectors have for inclusive job creation. It is a companion piece to a range of sector case study papers on agro-processing, light manufacturing, ICT and tourism (October 2017) that provide further details on what can be done in practice, based on new firm-level surveys of over 40 firms. This paper has two key findings.

Key finding 1: *Nepal is on course to reach lower-middle-income country (LMIC) status by 2030, but it is important to consider the feasibility and impact of sectoral growth paths to achieve a more desirable economic transformation pathway.*

Nepal has a number of plans and objectives for growth, transformation and job creation. The Government of Nepal (GoN) aims to achieve economic transformation through a series of three-year plans. The 12th Plan (2010–2013) targeted Nepal's graduation from *least developed country* (LDC) status to that of developing country by 2030. The 13th Plan (2013–2015) accelerated the target year for this process by 2022. The 14th Plan (2015–2017) does not alter the LDC graduation target, aiming to meet these goals by 2022, and adds the targets of achieving the Sustainable Development Goals and becoming a middle-income country (MIC) by 2030.

This paper first examines the feasibility of these high-level goals. We find, by projecting past growth rates (over 2000–2015) in population and gross value-added over 2015–2030, that Nepal should be able to attain LMIC status by 2029. However, this requires the creation of 6.1 million jobs, of which 3.1 million are needed simply to keep up with population growth (or 5.2 million if we take into account labour force growth). Some 3 million would need to be created by agriculture, which is of low productivity and could be considered questionable.

Nepal faces two additional challenges related to sectoral growth paths. Nepal's growth rate over the past has not been transformational or (high-quality) job-intensive. Economic transformation from agriculture to non-agriculture has been slow. In turn, jobless growth, lack of change in employment structures, casualisation and informalisation of jobs and a skills mismatch have acted as a push factor for youth to look for work overseas as distress employment. It is estimated that 3.5–4 million people are working abroad, generating remittances of more than 30% of gross domestic product.

Key finding 2: *Examining sector growth patterns in more detail suggests we should focus in more detail on four sectors to achieve a range of objectives such as prospects for sector growth, economic transformation, jobs and inclusion: agro-processing and light manufacturing; information and communication technology (ICT); tourism; and hydropower.*

We examine which sectors Nepal could focus on depending on a range of objectives, such as prospects for sector growth, economic transformation, jobs and inclusion. We use the following assessment criteria to assess the contribution of a sector to Nepal's development objectives:

- Past growth performance (over 2001–2015) and contribution to aggregate growth (direct impact);
- Labour productivity level (in 2015);
- Past record in creating jobs (direct impact), over 2001–2015;
- Inclusivity (direct impact), percentage and number of jobs that are female, informal or from rural areas;
- Number of studies indicating a sector as promising (notwithstanding constraints that may still exist).

Table ES below summarises the relevant information following these assessment factors. The overall assessment suggests the following sectors as important for achieving the range of objectives: growth, transformation, jobs and inclusivity:

- **Manufacturing.** Several studies suggest this sector is a promising one (especially **agro-processing and light manufacturing**), and it created a large number of jobs over 2001–2015. It is also seen as relatively inclusive, yet its contribution to growth has been low so far.
- **Transport, storage and communications.** Much of the interest in this sector is in the **ICT** sub-sector as promising, but overall the composite sector has grown fast, has high productivity and has contributed strongly to overall growth.
- We also add **tourism** to this list as we do not think the hotels and restaurants sub-sector fully captures the importance of the sector (e.g. it does not include transport, which is seen as a positive sector; and if the inclusivity criterion were widened the tourism sector would score higher on this too).
- **Electricity (hydropower).** This is a sector that has grown fast and, given the country's natural endowments, has much potential for the future.

The analysis in this paper also suggests agriculture, forestry and fishing is important because it has had major effects on growth and jobs in the past and it is regarded as an inclusive sector. However, agriculture is a very broad sector, with weak labour productivity overall, and there are major questions as to its ability to continue to grow at the same rate in the future. Much interest in the sector is in fact in the agro-processing component, discussed above, or in forest products. Further, the education sector has many desirable aspects, as documented in the table, but it is not seen as a sector that on its own can drive growth in the future. Of course, skills are important for other sectors, but even here there are questions as to whether more skills lead to faster growth, or whether faster growth in sectors leads to more and better skills (this question is being examined in our companion piece on the labour market in 4 sectors – agro-processing, light manufacturing, ICT and tourism – in Nepal based on firm surveys, October 2017).

Concluding, we suggest GoN finalise and implement a long-term vision for economic transformation and job creation that provides details on the positive role of government in promoting sectors to focus on based around the sectors suggested above. It can do this by rolling out an updated Vision 2030, which includes a targeted approach on the basis of appropriate prioritisation. We suggest the National Planning Commission be empowered to roll out such a strategy and have the power (backed up by a budget) to discipline and coordinate other departments around the national vision. Without targeting and better co-ordination, Nepal will not sufficiently transform. It could focus on four or five priority sectors, including agro-processing, light manufacturing, ICT, tourism and hydropower. The details of what can be done to promote each sector are discussed in the aforementioned companion paper that is based on firm-level surveys.

Table ES. The characteristics of different sectors in achieving Nepal's development objectives

Sector	Past growth rate	Contribution of sector to average growth	Current productivity level	Job creation record	Inclusivity of sector	Promising sector in literature	Overall assessment
Agriculture, forestry and fishing	Medium	High	Low	High	High	Medium	Positive
Mining and quarrying	Medium	Low	Medium	Low	High	Low	
Manufacturing	Low	Low	Medium	High	High	High	Positive
Electricity gas and water	High	Low	Medium	Medium	High	Medium	Positive
Construction	Medium	Medium	Medium	Medium	Medium	Low	
Wholesale and retail trade	Low	Medium	Medium	High	Medium	Low	
Hotels and restaurants	Low	Low	Low	Medium	Medium	High	
Transport, storage and communication	High	High	High	Medium	Medium	High	Positive
Financial intermediation	High	Medium	High	Low	Low	Low	
Education	High	High	Medium	Medium	Medium	Low	Positive
Health and social work	High	Low	Medium	Low	Low	Medium	
Public administration and defence	High	Low	Medium	Low	Low	Low	
Real estate, business and administration	Medium	Medium	High	Low	Low	Low	
Other community, social and personal service activities	High	Medium	Medium	Low	Medium	Low	
Criterion for scoring	Growth rate 2011–2015 L: ≤ 3.5 M: 3.5-4.5 H: ≥ 4.5	% contribution to growth 2001–2015 L: ≤ 5% M: 5%-10% H: ≥ 10%	% relative productivity level 2015 L: ≤ 30% M: 30%-100% H: ≥ 100%	Job creation 2001–2015 L: ≤ 100,00 M: 100.000-250,000 H: ≥ 250,000	Average of 3 components (% female jobs, % rural jobs and % informal workers in 2015	# included in 6 reviewed studies L: 0 M: 1-2 H: ≥ 3	Average score (L=1, M=2, H=3), positive when average score is greater than 2

Sources: This paper

1. INTRODUCTION

Building a consensus view of how Nepal can transform and create jobs in the future is crucial to incentivise policy action. Unfortunately, at present, there seems to be no unifying, practical vision on how the country can transform (and reach higher income levels) and create jobs. There also seems to be no political debate on job creation. In addition, there seems too little attention to the translation of national targets into practical action plans on job creation at sector level – looking at, for example, which constraint to overcome in which sector.

This paper examines credible pathways to prosperity and inclusive job creation from a scenario perspective. It discusses the type of sectors that help grow and transform Nepal and what implications different sectors have for inclusive job creation. It is a companion piece to a range of papers that are based on new firm-level surveys of over 40 firms in 4 sectors: agro-processing, light manufacturing, ICT and tourism (October 2017). This paper analyses secondary data and literature and does not attempt to provide much new analysis, apart from a few simple scenarios and data analyses. It provides insights into which sectors deserve priority.

Section 2 reviews Nepal's plans for growth, transformation and job creation. Section 3 discusses whether Nepal can reach its objective of becoming a lower-middle-income country (LMIC) by 2030. This objective frames the employment challenge. Section 4 then discusses how different sectoral growth patterns can provide pathways to prosperity in an inclusive way, including possible trade-offs between future incomes, prosperity, job creation and inclusion. Section 5 places these sectoral growth scenarios and sector attributes into a wider context and reviews promising sectors. It suggests that agro-processing, light manufacturing, information and communication technology (ICT) and tourism should be singled out for further analysis. Section 6 concludes.

2. NEPAL'S PLANS FOR GROWTH, TRANSFORMATION AND JOB CREATION

Nepal has a number of plans and objectives for growth, transformation and job creation. This section reviews these plans, which frame the modelling scenarios in subsequent sections. It also reviews the institutional structure within which these strategies are implemented.

2.1 Visions, strategies and policies

2.1.1 Graduation and income targets

The Government of Nepal (GoN) aims to achieve economic transformation through a series of three-year plans. The 12th Plan (2010–2013) targeted Nepal's graduation from *least developed country* (LDC) status to that of developing country by 2030. The 13th Plan (2013–2015) accelerated the target year for this process by 2022.[1] The 14th Plan (2015–2017) does not alter the LDC graduation target, aiming to meet these goals by 2022, and adds the targets of achieving the Sustainable Development Goals (SDGs) and becoming a middle-income country (MIC) by 2030.

[1] The identification of LDCs is currently based on three criteria: per capita gross national income (GNI), human assets and economic vulnerability to external shocks. The latter two are measured by two indices of structural impediments – namely, the Human Assets Index (HAI) and the Economic Vulnerability Index (EVI) (http://unohrlls.org/about-ldcs/criteria-for-ldcs/):

- *Income criterion*, based on a three-year average estimate of GNI per capita for the period 2011–2013, based on the World Bank Atlas method (under $1,035 for inclusion, above $1,242 for graduation as applied in the 2015 triennial review).
- *HAI*, based on indicators of (a) nutrition: percentage of population undernourished; (b) health: mortality rate for children aged five years or under; (c) education: gross secondary school enrolment ratio; and (d) adult literacy rate.
- *EVI*, based on indicators of (a) population size; (b) remoteness; (c) merchandise export concentration; (d) share of agriculture, forestry and fisheries; (e) share of population in low elevated coastal zones; (f) instability of exports of goods and services; (g) victims of natural disasters; and (h) instability of agricultural production

The target growth rate for the 14th Plan period is 7.2% annually, 4.7% in agriculture and 8.4% in the non-agriculture sector. The strategic drivers for enhancing growth are the transformation of agriculture, tourism and manufacturing and the expansion of medium-sized enterprises, alongside infrastructure development, including in energy, road and air transport, information and communication. The Plan tries to account for the major shocks in 2015. The income threshold is $1,242 per capita gross national income (GNI) in that year.

As part of the Envisioning Nepal 2030 project, the National Planning Commission (NPC) has set a new range of targets for Nepal, as seen in the 14th Plan: the SDGs by 2030, graduation from LDC status by 2022 and MIC status by 2030.[2] However, Envisioning Nepal 2030 has not moved forward significantly, with the exception of some initial studies and an international conference. There appear to be no practical visions or goals that are formally endorsed by the government. Nepal's Vision 2030 is under discussion and the threshold for becoming a MIC is not always stated clearly. The NPC targets in terms of reaching MIC status are often stated as reaching $2,500 GNI per capita by 2030,[3] yet the World Bank uses a different threshold: countries above $1,026 GNI per capita in 2017 are classified as lower-middle-income.

The budget for the fiscal year 2017/18 also identifies increasing the number of employment opportunities; improving production and productivity; the modernisation, commercialisation and mechanisation of agriculture; and infrastructure development, including in hydropower, road and rail transport and tourism, as priority sectors. It also mentions the creation of 400,000 jobs in the coming fiscal year, albeit without any clarity on the sectors and mechanism to create such jobs (MoF, 2017)

2.1.2 Employment

The 14th Plan acknowledges both the causes of employment problems and the potential for employment creation. As noted above, it mentions as its goal the creation of 400,000 jobs every year. Its objectives are to guarantee the right to work by gradually reducing semi-unemployment, underemployment and unemployment; to develop a competitive workforce by increasing opportunities for training and skills development; and to make foreign employment more productive, safe, disciplined and regulated.

The National Employment Policy 2014 acknowledges the importance of utilising a youthful labour force in the nation-building process and makes explicit reference to the need for vocational training for youths, especially in marginalised communities. The Employment Guarantee Scheme (EGS) guarantees jobs to all households living below the poverty line by guaranteeing wage employment to at least one unemployed family of poor households for 100 days.

One of the stated objectives of the Industrial Policy 2011 is to increase employment through promoting opportunities for self-employment and developing industrial skills and entrepreneurship. It also aims to improve youth employment under special strategies.

2.2 Institutional setting

The National Planning Commission (NPC) is the apex advisory body of the government. It formulates the national development vision, periodic plans and sectoral policies for development, including employment policy. Together with the Ministry of Finance (MoF), it also prepares development budgets. It serves as the central agency for monitoring and evaluating development plans, policies and programmes.

MoF is charged with the formulation of appropriate economic policy and undertaking the management of such policy for sustained and broad-based economic growth by maintaining both micro and macroeconomic stability. Specifically, its key role lies in the rational allocation of resources; the management of public expenditure; the mobilisation of both internal and external resources; prudent fiscal,

[2] https://www.adb.org/sites/default/files/publication/185557/envisioning-nepal-2030.pdf

[3] As discussed in the national preliminary report on the SDGs , drafted by the NPC: http://admin.myrepublica.com/politics/story/39749/npc-targets-2-500-per-capita-gni-in-next-15-years.html#sthash.k3WbDi1z.dpuf

monetary and foreign exchange policies; and effective coordination with other ministries and departments to ensure linkages between budget allocations and the delivery system.

The Ministry of Labour and Employment is primarily responsible for promoting a healthy work environment by creating employment and self-employment opportunities. Its main objectives are to eliminate unemployment by preparing skilled and competitive manpower in accordance with the national and international labour market; and to provide the labour force with a safe and healthy working environment.

The Ministry of Education aims to ensure people have the necessary skills to thrive in the labour market – a major responsibility. Coordination between the Ministry of Education and the Ministry of Labour and Employment is important to eliminate the skills mismatch that persists in the labour market to produce university graduates with desirable labour market skills. Under the Ministry of Education, the Council for Technical Education and Vocational Training (CTEVT) is working to generate skilled human resources. Its main task involves policy formulation, quality control, preparation of a competency-based curriculum, development of skill standards for various occupations and testing skills.

The Ministry of Youth and Sports is directly responsible for the development and capacity-building of youths and for promoting youth employment.

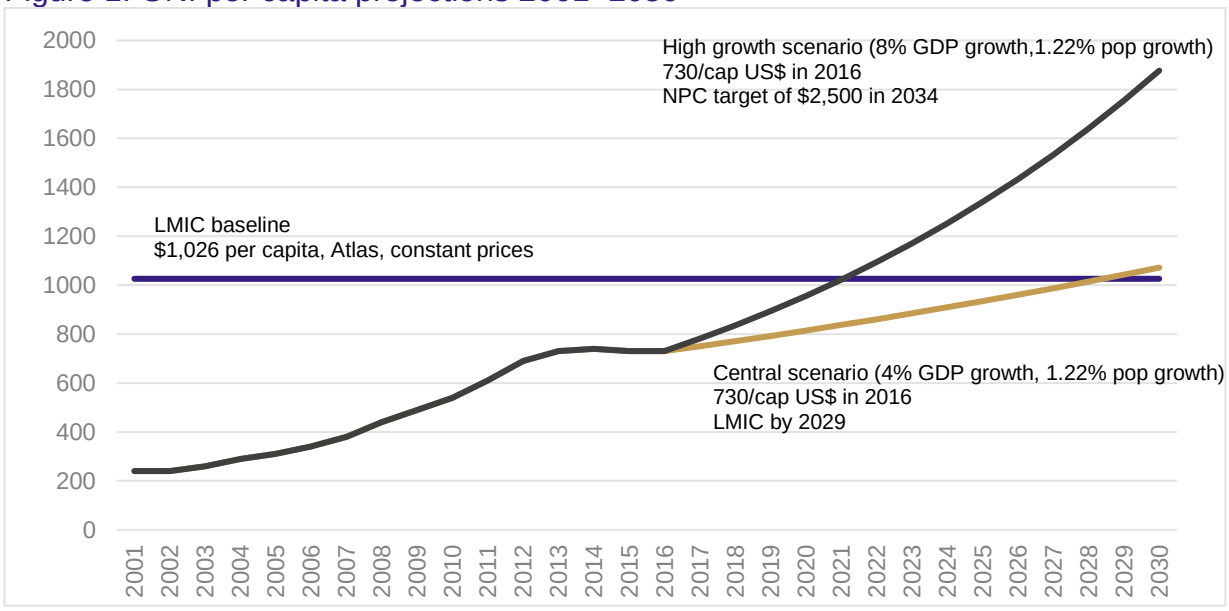
The Department of Foreign Employment regulates foreign employment and has an important responsibility to uphold with regard to the security and safety of migrant workers.

3. CAN NEPAL REACH MIDDLE-INCOME STATUS BY 2030?

We first discuss whether Nepal is on course to reach its development objectives of attaining MIC status by 2030 (this means reaching an income that is high enough for it to become an (L)MIC). GNI per capita in current US dollars according to the Atlas method was $730 in Nepal in 2014. Projecting forward using a 3.96% gross value-added (GVA) annual growth rate and an annual population growth rate of 1.22%, we find that Nepal will pass the LMIC threshold ($1,026 in 2017) in 2029. Of course, much depends on whether past growth rates can be projected forward. The World Bank (2017a), for example, has a lower base scenario in which LMIC status would not be reached.

The NPC targets, often stated as $2,500 GNI per capita, will not be reached until 2034, even with a higher gross domestic product (GDP) growth trajectory of 8% a year. Some argue that GVA growth rates should be 7–8% for Nepal to attain MIC status country (NPC and ADB, 2016: 4), but what is probably meant is that GVA growth rates at 8% will reach $2,500 by around 2030 (in fact our simulations suggest it will be 2034).

Figure 1. GNI per capita projections 2001–2030



Sources: WDI, own projections (population growth: 1.22% per year).

Poverty was reduced significantly over 2003–2010 (the poverty rate declined by 15% each year) in Nepal, owing much to remittance money transfers (World Bank, 2017a), at a time when GDP growth was around 4.2% annually. The period from 1995 to 2003 saw much lower percentage reductions in poverty rates (3.6% annually), but the GDP growth was similar at 4.5%. Thus the same growth rate (similar to the one we are projecting for 2015–2030) was accompanied by different poverty reduction rates, linked to the increase in remittances flows. Depending on our assumptions on how poverty might be reduced in the future (according to the recent period, or the period before), we project the poverty headcount rate to be between 0.6% and 8.1%.[4]

Table 1. Projecting poverty rates in 2030 on the basis of past developments

	Poverty rate in first year	Poverty rate in second year	Average GDP growth over period	Annual % reduction in poverty rate	Expected poverty rate in 2030 (apply reduction rate 2010–2030)
WDI (2003–2010)	46.12	14.99	4.2	14.8%	0.6
ADB (2004–2011)	53.1	24.8	4.2	10.3%	1.7
WDI (1995–2003)	61.9	46.12	4.5	3.6%	7.2
ADB (1996–2004)	68	53.1	4.5	3.0%	8.1

Sources: WDI poverty headcount ratio at $1.90 a day (2011 PPP) (% of population), ADB https://www.adb.org/sites/default/files/linked-documents/cps-nep-2013-2017-pa-detailed.pdf national poverty line, own calculations. % poverty reduction change uses annuity.

Nepal has experienced increases in inequality in the two decades between 1984 – 2003, with the Gini coefficient increasing from 30.1 in 1984 to 35.2 in 1995 and 43.8 in 2003. However, in line with significant poverty reduction, income inequality fell, with the Gini reaching 32.8 in 2010. This owes to growth fuelled by remittances, and this may not be sustainable in the future. Hence, we should also be examining which sectors contribute most to inclusion, recognising that complementary policies and institutions remain key.

[4] Remittances, the main driver of poverty reduction, have grown many times in the past decade and half. Using past trends assumes that remittances will continue to grow at a rapid rate; some see this as unrealistic. Remittances grew very little last year for example.

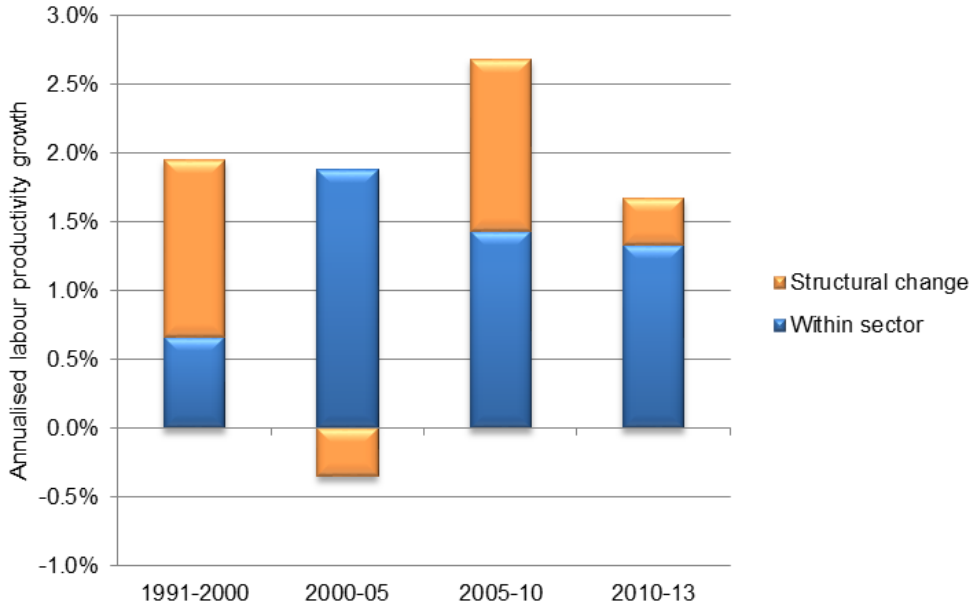
4. SCENARIOS FOR ECONOMIC TRANSFORMATION AND JOB CREATION

4.1 Lack of economic transformation

Apart from the growth challenge discussed in Section 3, Nepal faces two additional challenges. Its growth rate over the past has not been transformational and (high-quality) job-intensive. An inappropriate reform agenda, coupled with political instability and conflict, has resulted in sluggish and 'jobless' economic growth, as economic transformation from agriculture to non-agriculture has been slow. In turn, jobless growth, lack of change in employment structures, casualisation and informalisation of jobs and a skills mismatch have acted as a push factor for youth to look for work overseas as distress employment. It is estimated that 3.5–4 million people are working abroad, generating remittances of more than 30% of GDP.

Detailed tables in Appendix A contain key sector statistics on GVA, employment and labour productivity over the period 2000–2015. It calculates labour productivity levels by dividing GVA in a sector by the number of people employed in that sector. The data show that growth has been fastest in those sectors (finance, transportation and real estate) that are least employment-intensive and with highest labour productivity. Sectors that have grown less fast (such as agriculture, manufacturing and hotels and restaurants) are among the most labour-intensive (see Appendix A) and weaker productivity. Data analyses over previous periods show that only modest structural change has taken place. Further, labour productivity growth has slowed down in recent years (Figure 2) and labour productivity growth has been at a much lower level compared with such growth in Asian countries generally, which reached 5.8% a year over 2002–2013 (McMillan et al., 2017).

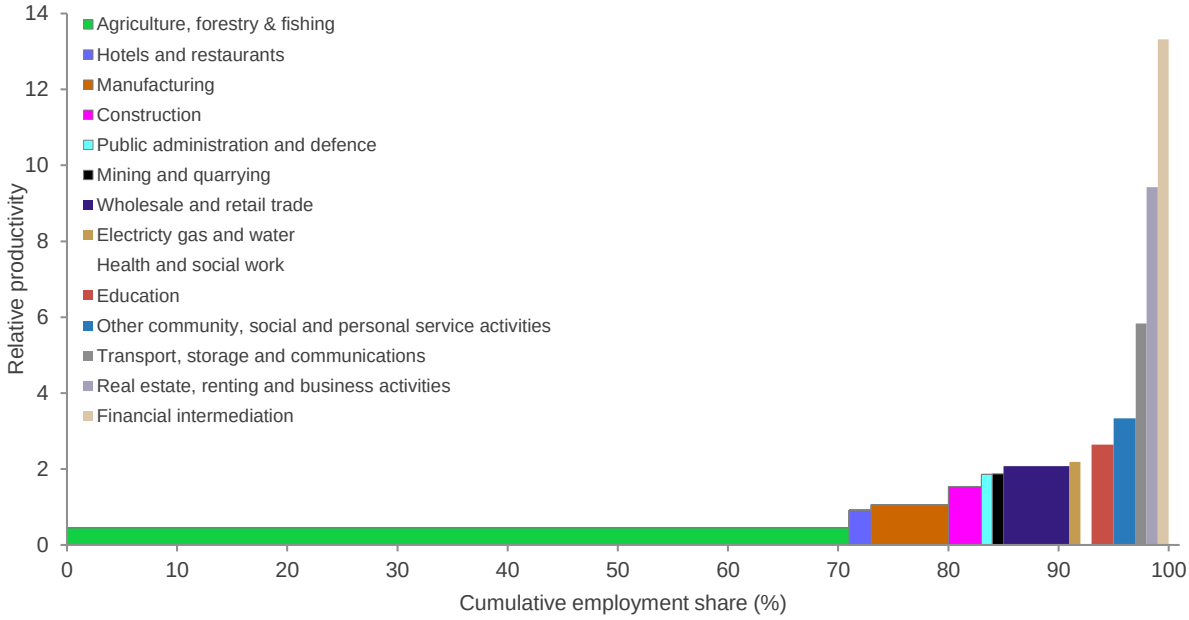
Figure 2. Within- and between-sector labour productivity



Source: SET data portal (www.set.org).

Thus, further productivity change, especially through structural change and an increase in productive employment, will be important for Nepal. Figure 3 suggests moving labour from agriculture to other sectors will raise aggregate growth considerably.

Figure 3. Relative productivity gap in Nepal, 2014–2015



Sources: See Appendix A. GVA in 2001 prices from national accounts data, employment from ILO WESO.

4.2 Growth and labour demand projections by 2030

We discuss future scenarios for sectoral growth, labour demand and labour supply in Appendix A. Table 2 lists the key parameters and assumptions behind the scenarios.

Table 2. Key parameters and assumptions

Key parameters	Assumptions for central scenario	Alternative scenarios that could be considered
Labour force (growth over 2015–2030 depending on labour force participation rates)	1.95% annually (based on past growth rates between 2000 and 2015 using ILO data)	
Population growth	1.22% annually (based on past growth rates between 2000 and 2015)	
Net labour migration over 2015–2030	Annual average of 0.006% of the population (a further net 3 million workers leave Nepal)	No net migration (see comment in text)
Growth in sectoral value addition over 2015–2030 (including implied sectoral shifts)	Past growth rate in individual sectors (3.94% annual growth over 2000–2015 for whole economy)	Uniform growth rate across sector; calibrated growth rate
Growth in labour productivity change at sector level and implied aggregate labour productivity shifts	Past growth rate in individual sectors (1.55% annually over 2000–2015)	No productivity changes Economic transformation
Other factors not previously included	None	Shock to GDP

As argued in Section 3, projecting past growth rates (2000–2015) in population and GVA over the period 2015–2030 suggests Nepal can attain LMIC status by 2029. Based on the parameters in Table 2, we find this growth path requires the creation of 6.1 million jobs, of which 3.1 million are needed simply to keep up with population growth (or 5.2 million if we take into account labour force growth). Projecting labour supply and demand forward on the basis of past growth rates in GVA and labour productivity leads to a labour deficit of around 3.6 million by 2030. This assumes net migration carries on as usual. If instead there is zero net migration over the period 2015–2030, the labour deficit is 0.6 million. Of course, these projections are vulnerable to economic shocks. Lower GVA growth, for example a decrease by 10% in all sectors, would lower employment by 1 million. Adding this leads to a total labour surplus of 0.4 million. The labour surplus would be much higher if all workers abroad (estimated to be 3–4 million) would return.

4.3 Sectoral growth patterns and inclusive job creation

Past sectoral growth patterns may not be a good guide for the future and we need to examine how different sectors can contribute to growth. Table 3 applies changes to individual sectors in order to obtain a 1% change in aggregate GVA. We then examine what it means for employment and labour productivity, given estimated employment intensities. If the 1% GVA growth is based entirely on the construction sector, labour demand increases by 0.79% and labour productivity by 0.21%. But if the 1% GVA growth is based entirely on the agriculture sector, labour demand increases by 2.36% (the sector is labour-intensive), whereas aggregate labour productivity drops by 1.33% (the sector is least productive). So lots more jobs, but of less quality and lower productivity than the economy as a whole, leading to lower aggregate wages. Or, put differently, LMIC status requires the creation of many more jobs if it is based on agriculture alone.

Table 3. The impact of sectoral growth on employment and aggregate labour productivity

Sector	Increase in aggregate GVA	Calibrated sectoral growth required to achieve this	% change in aggregate EMP in 2030	Impact on aggregate LABPROD % in 2030
Construction	1%	18.5%	0.79%	0.21%
Manufacturing	1%	21.0%	1.39%	-0.38%
Tourism	1%	65.7%	1.90%	-0.88%
Agriculture	1%	3.7%	2.36%	-1.33%

Source: Own calculations based on simulations.

We further examine the effects of sectoral growth patterns on the employment of disadvantaged groups. This paper aimed to include female, youth, lagging regions, lower castes and informal workers as disadvantaged groups, recognising there are many other groups. However, we have reasonable data only for female, urban and informal workers; to improve the data for other dimensions future labour force surveys should include more data on more categories of disadvantaged groups. Different sectors employ different types of workers and thus different sectoral growth patterns have different effects for different groups. Table 4 shows that agriculture and the electricity, gas and water sector employ relatively more women, whereas transport and communications employs relatively few women. The agriculture, mining and construction sectors employ mainly rural workers; finance and electricity mainly take urban workers. Agriculture, mining, wholesale, trade and hotels and restaurants mainly employ informal workers; health, education and finance mainly employ formal workers.

Table 4. Employment intensities by sector

	% informal workers	% female workers	% urban workers
Agriculture, forestry and fishing	99.7	58.6	5.7
Mining and quarrying	99.7	29.4	11.1
Manufacturing	93.2	40.7	27.7
Electricity gas and water	91.2	66.0	29.4
Construction	96.0	10.6	20.4
Wholesale and retail trade	98.9	34.8	38.2
Hotels and restaurants	96.7	49.1	47.2
Transport, storage and communications	83.8	3.9	32.8
Financial intermediation	47.9	31.7	62.5
Education	94.4	16.2	30.9
Health and social work	21.9	11.6	39.0
Public administration and defence	51.6	32.4	49.5
Real estate, business and administration	51.3	40.4	50.7
Other community, social and personal service activities	88.1	29.6	44.4
Average (unweighted)	79.6	32.5	35.0

Sources: Labour Force Survey and other sources. Sectors classified based on national accounts.

We run a number of scenarios. We first raise growth by 1% by adding NPR 14 trillion (2001 prices) to 2030 GVA, or NPR 1 trillion to each of the 14 sectors identified above. We then raise growth by 1% by adding NPR 14 trillion to only one sector: first agriculture, then manufacturing, construction and tourism. A 1% increase in GVA that comes from all sectors equally would lead to 0.13 million more jobs, but if the increase in GVA came from manufacturing this would lead to 0.22 million jobs; construction 0.17 million; tourism 0.41 million; and agriculture 0.52 million. It thus matters for employment in which sectors growth occurs.

As Table 5 shows, a 1% increase in GVA that comes from all sectors equally would lead to 0.07 million more female jobs, but if the increase in GVA came from manufacturing this would lead to 0.12 million female jobs; construction 0.02 million; tourism 0.20 million; and agriculture 0.30 million. A 1% increase in GVA that comes from all sectors equally would lead to 0.07 million more rural jobs, but if the increase in GVA came from manufacturing this would lead to 0.14 million rural jobs; construction 0.02 million; tourism 0.22 million; and agriculture 0.49 million. We also examine a further scenario that lowers growth in all sectors by 10%. This leads to a fall in employment of 1 million. The conclusion is that it is important to consider the impact of sectors on growth.

Table 5. Sectoral growth patterns and aggregate employment of disadvantaged groups

	Total emp.	Female emp.	Rural emp.	Informal emp.	Total emp.	Female emp.	Rural emp.	Informal emp.
Scenario	% difference from base	% difference from base	% difference from base	% difference from base	Absolute difference (million)	Absolute difference (million)	Absolute difference (million)	Absolute difference (million)
1% increase in total GVA equally divided over all sectors	0.82%	0.70%	0.70%	0.77%	0.18	0.07	0.13	0.16
1% increase in total GVA through manufacturing	1.39%	1.15%	1.20%	1.36%	0.30	0.12	0.22	0.28
1% increase in total GVA through construction	0.79%	0.17%	0.75%	0.79%	0.17	0.02	0.14	0.16
1% increase in total GVA through tourism	1.90%	1.90%	1.19%	1.92%	0.41	0.20	0.22	0.40
1% increase in total GVA through agriculture	2.36%	2.82%	2.65%	2.46%	0.52	0.30	0.49	0.51
10% lower growth in each sector	-4.81%	-4.54%	-4.72%	-4.71%	-1.05	-0.49	-0.86	-0.98
Addendum (base, absolute)	21,795.7	10,687.8	3,491.6	20,847.9				

Source: Own calculations using data presented in Appendix A.

There are many dimensions of inequality (including age, gender, location, education, formality, caste etc.). We do not have all data available. A World Bank study on social mobility suggests that the key determinant of life chances is the level of education, but we do not have data on employment by skills/education *and* sector, or age *and* sector. We therefore use three imperfect measures of inequality in the next section: employment by location, formality and gender. Further work should look into the other components of inequality and collect data on these dimensions.

5. CHOOSING SECTORS FOR FURTHER ATTENTION IN NEPAL

It is not easy to determine which sector deserves most attention, if such targeting can and should take place. Different sectors have different economic and social characteristics, some are growing fast, some have high productivity and some are good job creators. Moreover, the past is not always a good guide for the future and different sectors could be more promising now than in the past. This section brings together the evidence on the opportunities, constraints and characteristics of the various sectors in Nepal with the

aim of forming a general judgement on what type of sectors would be worth backing. This section provides general background and further detailed analysis could be helpful, for example in terms of indirect effects of sectors, value chain approaches, etc. Section 5.1 reviews the literature on sectoral opportunities and constraints in Nepal. Section 5.2 summarises the information in a table.

5.1 Literature review and broad analysis on sector growth

We review the recent literature in sector growth in Nepal followed by a number of broad empirical analyses. The Asian Development Bank (ADB) (2010) suggests Nepal has a range of economic (comparative) advantages:

1. Nepal borders two significant markets – China and India – with strong potential to export agricultural goods to Bangladesh.
2. Middle Eastern countries could become a potential source of consumption for Nepalese agricultural goods.
3. China[5] and India have set up trade treaties, providing concessions to a number of Nepalese export products.
4. Tourism benefits from Mount Everest (natural tourism) and the historically significant town of Lumbini for Buddhist religious tourism.
5. There is a significant potential to generate and sell hydropower.

However, these advantages are muted by a lack of infrastructure – for energy, transport and communications – as well as long periods of macroeconomic instability. Although the country suffered the dual impacts of an earthquake in 2015 and an Indian trade blockade in 2016, growth is estimated to be 7.5% in 2017, a significant increase from the 0.4% growth rate low of 2016 and the highest (estimated) growth rate since 1994. Reforms in the management of electricity networks have led to reductions in electricity outages (typically referred to as *brown-outs*) across urban areas, although the effects on rural areas is not clear; an additional 100MW of hydro-electric generation capacity is expected to bolster the power grid in 2017 (World Bank, 2017b).

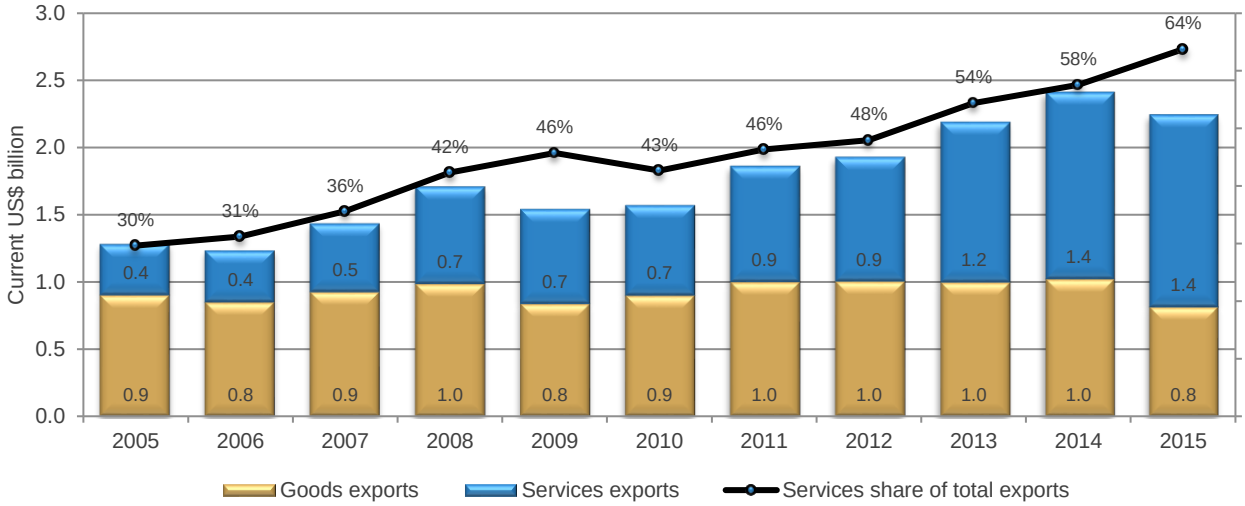
The current import and export situation can help us identify promising sectors in terms of external market potential, by highlighting growth exports, as well as those that exhibit internal market potential, by highlighting what is currently being imported. Imports have grown to approximately $650 million a month, and, excluding petroleum products, these were driven by increases in the purchase of transport goods (private vehicles), iron and steel, chemical fertiliser and cement (World Bank, 2017b).

The latest data are broadly in line with the import composition in 2015 (see Appendix B), which shows petroleum products as the top import category, shortly followed by products used for ICT purposes, clothing, transport goods, construction goods and food products. The total volume of exports is significantly smaller than imports, where in 2017 exports totalled $60 million per month (World Bank, 2017b). The latest available (detailed) breakdown for Nepalese exports of goods is for 2015 (see Appendix B) and shows exports being led by woven fabrics (led carpets and synthetic staple fibres), agro-processed goods, processed construction materials (iron and steel products) and plastics.

However, the real success story and the explaining factor in the large prevalence of ICT goods is the significant increase in the share of services in exports in the country, where there has been rising demand for ICT equipment used in service activities. From 2005 to 2015, services more than doubled in terms of their export share and were worth nearly twice as much as goods (Figure 4 below).

[5] Nepal has also officially signed a memorandum of understanding with China to take part in China's 'One Belt, One Road' initiative, which further increases the potential for Nepalese exports to the Chinese market (and vice versa): http://www.eastasiaforum.org/2017/06/17/chinas-belt-and-road-reaches-nepal/

Figure 4. Exports of goods and services, Nepal (2005–2015)



Source: Authors' calculation using data from the World Bank's WDI.

ICT and tourism sectors were both identified as a potential growth sector by the World Bank in 2012, noting the need to invest in infrastructure (energy, transport and communication) in order to support these sectors (Afram and Del Pero, 2012). The Danish International Development Agency (Danida) carried out a business opportunity profiling of Nepal in 2013, also noting its closeness to India and China as potential expansion markets – identifying five priority sectors for the country including ICT, agro-business and tourism (see summary table below). Ellis et al. (2013) carried out an assessment of potential low-carbon sectors in Nepal that could drive future growth, although the emphasis was on 'green' sectors the paper identified tourism, hydropower and non-timber forest products as potential growth (and export) sectors.

The International Labour Organization (ILO) assessed where there was potential to promote employment-centric growth in the country (ILO, 2016) and identified agriculture, manufacturing, services, tourism and construction as being strong employment creation sectors; however, the study does not delve into why these sectors would have strong opportunities for growth in the country. Finally, Xu and Hager (2017) apply the Growth Identification and Facilitation Framework (GIFF) to Nepal,[6] identifying the need for the country to 'catalyse structural transformation' and the light manufacturing sector as one where there is potential, especially if the country can foster products that can take advantage of preferential tariff access to the US and the EU.

GoN has itself identified 12 priority products through its National Trade Integration Strategy (GoN, 2016). These are divided into three broad areas: agro-based products, crafted and manufacturing goods and services – further details are provided in the summary table (Table 7). GoN has based its evaluation on the capacity of these products to generate employment and contribute to poverty reduction cross-referenced with in-country capabilities. It has conducted a Strength, Weakness, Opportunities and Threats (SWOT) analysis for each product and has stated that it intends to support each relevant industry to maximise export potential.

Overseas Development Institute (ODI) calculations of the country's revealed comparative advantage (RCA) highlight five potential sectors for 2015 (see Table 6 and Appendix B for a full table), showing textiles, works of art (handicraft), vegetable products, footwear and prepared foods as potential export sectors.

[6] A sectoral growth identification tool first developed by Justin Lin in 2010 see: http://documents.worldbank.org/curated/en/438321468164948980/pdf/WPS5313.pdf

Table 6. Nepal top 5 RCA sectors, 2015

HS Sect.	Product label	2009	2010	2011	2012	2013	2014	2015
11	Textiles and textile articles	7.95	9.09	9.7	8.88	9.29	8.78	8.69
21	Works of art, collectors' pieces and antiques	15.3	8.8	7.03	5.47	6.78	6.82	5.98
2	Vegetable products	6.78	6.61	5.16	6.26	4.4	5.62	5.65
12	Footwear, headgear, umbrellas, sun umbrellas, walking-sticks, seat-sticks, whips, riding-crops and parts thereof; prepared feathers and articles made therewith; artificial flowers; articles of human hair	1.62	2.59	4.03	3.75	4.33	3.43	3.51
4	Prepared foodstuffs; beverages, spirits and vinegar; tobacco and manufactured tobacco substitutes	2.12	1.89	2.21	2.43	3.06	3.2	3.14

Note: Share of country's exports in each HS Section in country's total exports as a ratio of share of world exports in each HS Section in world total exports. 'World' = an aggregate of all countries reporting to UN COMTRADE's in any given year. Source: Authors' calculations using data from the UN's COMTRADE database.

Finally, the product space map of Nepal for 2015 (see Appendix B) reveals potential sectoral pathways to foster economic transformation. It highlights Nepal's current productive capacity for export goods in 2015, showing a cluster of textile and garment goods (in green), construction goods and agricultural products. Most of these are concentrated on the eastern fringe of the product space map, with little productive capacity in the higher-productivity sectors in the middle of the product space map. Further detailed analysis would be required to identify the specific products with the best growth prospects.

We summarise the suggestions on sectors identified through the reviewed literature in Table 7 below. Four sectors are common across the reviewed recommendations:

1. **Agro-processing:** Recommended as a result of existing production and capabilities, capacity to generate rural employment and comparative advantages in terms of product quality and production costs;
2. **Light manufacturing:** Concentrated specifically on garments, footwear, leather and handicraft. Recommended based on low labour costs, capacity to generate employment, capacity to meet internal and regional demand;
3. **Tourism:** Continued support to an already important sector, based on international recognition and demand for multiple, internationally renowned, cultural and natural attractions;
4. **ICT:** Based on low labour costs, an English-speaking (young) population and relatively good levels of connectivity.

Table 7. Summary table of identified priority sectors in Nepal

Source	Sectors	Reason given
Afram and Del Pero (2012)	ICT	English language; limited impact of geography and Nepali landlocked status.
	Tourism	Himalayas for natural tourism, large biodiversity, sites of historic significance and use of English language.
Danida (2013)	Agro-business	Multiple products with export potential – cardamom, ginger, honey, lentils and teas – supported by the Nepal Trade Integration Strategy (NTIS), capacity to expand production in Terai region.
	Handicraft	Potential global markets, tradition of handicraft production, raw materials are available locally and production can be orientated towards export markets
	Healthcare	Ayurvedic tradition, moderate climate, availability of medicinal herbs.
	Tourism	Comparative advantage sector, government considers it a priority sector, rich biodiversity and established tourist sites, experienced sector.
	ICT	English language proficiency, less affected by politics, basic laws are in place, labour cost advantages compared to India; capacity to carry out a wide range of services.
Ellis et al. (2013)	Tourism	Significant economic benefits if aimed at sustainable management and promotion of eco-tourism.
	Hydropower	Strong potential for hydroelectric power generation and export, however requires removal of fossil fuel subsidies.
	Non-timber forest products	Can help manage forest sustainability (with positive spillovers on tourism and hydroelectric power generation) based on locally available, easy to export, products.
Xu and Hager (2017)	Light manufacturing	Sectors such as garments and footwear, relatively lower labour costs in Nepal, labour-intensive, relatively easy to acquire necessary skills.
RCA (ODI calculations this paper, 2017) and Product Space	Textiles, works of art (handicraft), vegetable products, footwear, prepared foods	High RCA score for the chosen (export-oriented) products. Strong concentration of production already existent in these products (per the product space map) and can be a good starting point (especially textiles and agro-processed goods) to move production towards more complex and higher-productivity manufacturing goods.

Source	Sectors	Reason given
GoN (2016)	Agro-processed goods	Cardamom; ginger; tea; medicinal and aromatic plants Can leverage (strong) existing production processes and favourable geographic conditions; goods are high value and significant employment source for women and rural households.
	Textiles and leather	Fabrics; leather; footwear; pashmina; carpets Competitive labour markets, strong employment opportunities and existing availability of capital in-country; good-quality products with international reputation; growing domestic market for leather and footwear goods and capacity to export to regional neighbours.
	ICT/business process outsourcing	Labour cost advantage *vis-à-vis* competitor countries; young workforces; English language proficiency; improved connectivity.
	Remittances	Globally cost-competitive resources; importance of remittances for in-country poverty reduction; low cost of remittances transfers.
	Tourism	Existing natural and historical attractions; established international brand for adventure and nature tourism; good airline connectivity; government priority sector.

However, it is also important to note that recent growth diagnostics have identified constraints in these four sectors as well as in horizontal sectors such as transport and energy. Basnett et al. (2014) identified rural infrastructure, lack of agricultural inputs, energy sector market systems (and market information) inefficiencies and weak institutional support for tourism as major growth constraints in the four (above) priority sectors. Concurrent work by the Millennium Challenge Corporation (MCC, 2014) found electricity generation, transport costs, complex industrial relations and regulations and policy uncertainty as hindrances to growth in the country.

5.2 Summary of findings and discussion

We are now in the position to summarise the findings regarding which sectors Nepal could focus on depending on a range of objectives such as past and future prospects of the sector for growth, transformation, jobs and inclusion. We use the following assessment criteria to assess the contribution of a sector to Nepal's development objectives:

- Past growth performance (over 2001–2015) and contribution to aggregate growth (direct impact);
- Labour productivity level (in 2015);
- Past record in creating jobs (direct impact), over 2001–2015;
- Inclusivity (direct impact), percentage and number of jobs that are female, informal or from rural areas;
- Number of studies (reviewed above) indicating a sector as promising (notwithstanding constraints that may still exist).

From the outset we should also point to the limitations of this analysis. We do not have access to elaborate analyses that can examine indirect effects of certain sectors on other sectors. We keep this summary at an aggregate level, even though we know that we need to operate at a more aggregate level. We score sectors as low, medium or high, and in some cases the thresholds and criteria used can be limiting or arbitrary. And we aggregate scores using the same weights for each sector. For some measures, we know

we have few and incomplete data. For example, if we had data we should add a measure of whether a sector is intensive in low-skilled labour which is an important criterion for inequality. Doing this would probably favour sectors such as manufacturing and tourism.

Nonetheless, the summary allows a general discussion on the different desirable effects of different sectors, which can be refined further in growth diagnostics. Table 8 provides the relevant information, including the criterion used for each of the assessment factors. The overall assessment suggests the following sectors as important for achieving the range of objectives: growth, transformation jobs, and inclusivity:

- **Agriculture, forestry and fishing.** This sector is important because it has had major effects on growth and jobs in the past and it is seen as an inclusive sector. However, agriculture is a very broad sector, with weak labour productivity overall, and there are major questions about its ability to continue to grow at the same rate in the future. Much interest in the sector is in fact in the agro-processing component, discussed below, or in forest products.
- **Manufacturing.** Several studies suggest this sector as a promising one (especially agro-processing), and it created a large number of jobs over 2001–2015. It is also seen as relatively inclusive, yet its contribution to growth has been low so far.
- **Electricity (hydropower).** This is a sector that has grown fast and, given the country's natural endowments, has much potential for the future.
- **Transport, storage and communications.** Much of the interest is in the **ICT** sub-sector as promising, but overall the composite sector has grown fast, has high productivity and has contributed strongly to overall growth.
- **Education.** This sector has many desirable aspects, as documented in Table 8, but it is not seen as a sector that on its own can drive growth in the future. Of course, skills are important for other sectors but even here are questions on whether more skills lead to faster growth, or whether faster growth in sectors leads to more and better skills (this question is examined in our companion papers on 4 sectors based on firm surveys).

Our analysis suggests there is sufficient evidence to focus more on **agro-processing, light manufacturing and ICT.** We would also add **tourism** to this as we do not think that the hotels and restaurants sub-sector fully captures the importance of the sector (e.g. it does not include transport, which is seen as a positive sector; and if the inclusivity criterion were widened the tourism sector would score higher on this too). These sectors will be taken forward and explored further in the companion papers to this study of the four sectors, plus an overall labour market in Nepal paper by ODI/SET (October 2017).

Table 8. The characteristics of different sectors in achieving Nepal's development objectives

Sector	Past growth rate	Contribution of sector to average growth	Current productivity level	Job creation record	Inclusivity of sector	Promising sector in literature	Overall assessment
Agriculture, forestry and fishing	Medium	High	Low	High	High	Medium	Positive
Mining and quarrying	Medium	Low	Medium	Low	High	Low	
Manufacturing	Low	Low	Medium	High	High	High	Positive
Electricity gas and water	High	Low	Medium	Medium	High	Medium	Positive
Construction	Medium	Medium	Medium	Medium	Medium	Low	
Wholesale and retail trade	Low	Medium	Medium	High	Medium	Low	
Hotels and restaurants	Low	Low	Low	Medium	Medium	High	
Transport, storage and communication	High	High	High	Medium	Medium	High	Positive
Financial intermediation	High	Medium	High	Low	Low	Low	
Education	High	High	Medium	Medium	Medium	Low	Positive
Health and social work	High	Low	Medium	Low	Low	Medium	
Public administration and defence	High	Low	Medium	Low	Low	Low	
Real estate, business and administration	Medium	Medium	High	Low	Low	Low	
Other community, social and personal service activities	High	Medium	Medium	Low	Medium	Low	
Criterion for scoring	Growth rate 2011–2015 L: ≤ 3.5 M: 3.5-4.5 H: ≥ 4.5	% contribution to growth 2001–2015 L: ≤ 5% M: 5%-10% H: ≥ 10%	% relative productivity level 2015 L: ≤ 30% M: 30%-100% H: ≥ 100%	Job creation 2001–2015 L: ≤ 100,00 M: 100.000-250,000 H: ≥ 250,000	Average of 3 components (% female jobs, % rural jobs and % informal workers in 2015	# included in 6 reviewed studies L: 0 M: 1-2 H: ≥ 3	Average score (L=1, M=2, H=3), positive when average score is greater than 2

Sources: This paper.

6. CONCLUSION AND IMPLICATIONS

With the promulgation of the Constitution, and after protracted political conflicts, there seems political consensus among the major political parties on the imperatives of rapid economic transformation and adequate job creation. Building a consensus view of how Nepal can transform and create jobs in the future is crucial to incentivise policy action. Unfortunately, at present, there seems to be no unifying, practical vision on how the country can transform (and reach higher income levels) and create jobs.

This paper first examined future paths for economic transformation and job creation in Nepal. Using reasonable assumptions, we find that Nepal seems to be on course to reach MIC status by around 2030. This depends on projecting past trends into the future. For example, informed by past trends, reaching LMIC status would require agriculture to grow by 3.1% annually and to add 3 million jobs by 2030. Some suggest this may be difficult or not desirable, so the question is what other sectors can drive economic transformation and job creation in the future. Unfortunately, the general consensus on Nepal's growth and poverty trajectory is that there has been reasonable growth but without significant transformation and the creation of productive jobs outside agriculture. It is therefore important to consider the feasibility and impact of sectoral growth paths that might underpin this.

There are different ways to assess the feasibility and impact of different sectors driving transformation. This paper focused on using a range of development objectives such as growth, economic transformation, job creation and inclusion. Based on these criteria, this paper suggests focusing on the following sectors

- **Manufacturing.** This promising sector (agro-processing and light manufacturing) created a large number of jobs over 2001–2015. It is also seen as relatively inclusive, yet its contribution to growth has been low so far.
- **ICT.** This promising sector has high productivity and is increasingly contributing to growth.
- **Tourism** is also important not only for the hotels and restaurants sub-sector but also related transport.
- **Electricity (hydropower).** This is a sector that has grown fast and, given the country's natural endowments, has much potential for the future.

Countries (incl. many Asian countries) that have transformed successfully in the past have done so coalescing around a vision and ensuring this vision is being implemented. The GoN should finalise and implement a long-term vision for economic transformation and job creation that provides details on the positive role of government in promoting sectors for economic transformation and job creation around the sectors suggested above. It can do this by rolling out an updated Vision 2030, which includes a targeted approach on the basis of appropriate prioritisation. We suggest the NPC be empowered to roll out such as strategy and have the power (backed up by a budget) to discipline and coordinate other departments around the national vision. A companion ODI-SET paper on the labour market in Nepal (October 2017) discussed the contents of such a strategy in more detail.

APPENDIX A: SCENARIO ANALYSIS

This Appendix outlines possible scenarios in terms of quantity of jobs (in aggregate terms), quality of jobs (labour productivity) and inclusivity of jobs in Nepal (by age, gender, formality and geography). It considers how disadvantaged people, such as female, informal, rural and/or young workers, may (or may not) access jobs (i.e. 'inclusive' job creation). It provides scenarios for the creation of new jobs by 2030 informed by sectoral growth scenarios and a range of other parameters.

Aggregate employment

We first consider aggregate employment by examining demand and supply of labour and calculating the gap between jobs needed and labour force growth under different scenarios. We are particularly interested in the type of sectoral growth scenarios that can create sufficient jobs, that are productive (with high labour productivity) and that are inclusive (jobs for disadvantaged groups). Among other issues, this means the projected gap (in, say, 2030), GAP_{2030}, between labour supply (LABSUP) and labour demand (LABDEM) is sufficiently close to zero:

1) $GAP_{2030} = LABSUP_{2030} - LABDEM_{2030}$

Labour supply in 2030 depends on estimated annual labour force growth rates (*lf*) over the period 2015–2030 minus net migration over that period.

2) $LABSUP_{2030} = lf^{\wedge 15} * LABSUP_{2015} - NETMIGR_{2015\_2030}$

lf = annual growth rate in labour force
$LABSUP_{2015}$ = labour force supply in 2015

$NETMIGR_{2015\_2030} = \sum_{t=2015}^{2030}(EMIGR_t - IMMIGR_t)$

Data from the International Labour Organization (ILO) World Employment and Social Outlook (WESO) (for 2015) on the labour force show an increase of just under 4 million people within the Nepal labour force for the 2000–2015 period, equivalent to an average annual growth rate of 1.95%. Projecting this forward provides an estimate of approximately 21 million people in the labour force by 2030, broadly in line with ILO estimates for the country in 2030. The female labour force has higher growth rates and absolute numbers both in aggregate and for youth.

Using historical data, we estimate:

lf = 1.95% and
$LABSUP_{2015}$ = 15,855,000

Table 9. Labour force (in 000s) in 2000, 2015 and 2030 (ODI and ILO estimates) and average annual growth rate

Year	Total labour force	Male labour force	Female labour force	Youth labour force	Youth male labour force	Youth female labour force
2000	11,870	6,102	5,768	3,673	1,806	1,867
2015	15,855	7,733	8,122	4,402	2,128	2,274
Average annual growth rate (%)	1.95	1.59	2.31	1.22	1.11	1.33
2030eODI	21,182	9,797	11,440	5,280	2,511	2,772
2030eILO	20,994	10,536	10,458	-	-	-

Note: Labour force includes economically active population from 15 years upwards.
Sources: ILO WESO 2015, ILOSTAT, own calculations.

Net migration rates, estimated by the UN World Population Prospects (WPP) (July 2015 revision), place net migration at an annual average of 0.006% of the population for the period from 2000 to 2015; average annual population growth rates were estimated to be 1.22% for the same period. Projecting the estimate for migration forward, we estimate net migration over the period 2015–2030 as follows:

$$NETMIGR_{2015\_2030} = 3{,}002{,}650$$

Table 10. Estimated population and net migration

Year	Population (000s)	Net migration (000s)
2015	28,514	171.08
2016e	28,862	173.17
2017e	29,214	175.28
2018e	29,570	177.42
2019e	29,931	179.59
2020e	30,296	181.78
2021e	30,666	184.00
2022e	31,040	186.24
2023e	31,419	188.51
2024e	31,802	190.81
2025e	32,190	193.14
2026e	32,583	195.5
2027e	32,980	197.88

Year	Population (000s)	Net migration (000s)
2028e	33,383	200.3
2029e	33,790	202.74
2030e	34,202	205.21
Total	-	3,002.65

Sources: UN WPP 2015, own calculations.

Our calculations (Table 10 above) suggest a potential increase in population to 34.2 million by 2030. This estimate is closely in line with Nepal government estimates carried out in 2011 (CBS, 2011), which project the population in 2030 at approximately 33.6 million.

Assuming that all migrants are potential workers, labour supply in 2030 is

$$LABSUP_{2030} = 21{,}182{,}000 - 3{,}002{,}650 = 18{,}179{,}350$$

Labour demand in 2030 depends on the sum of employment in sector *i* times the growth rates in value-added ($g_{GDP,i}$) in that sector times the level of labour productivity in that sector in 2030, $LP_{2030,i}$ (see Equation 3). We abstract from wage effects for now, but increases in real wages can lead to substitution of capital for labour. Future LP depends on current LP times the expected growth rates in labour productivity over 2015–2030.

3) $LABDEM_{2030} = \sum_{i=1}^{10} g_{GDP,2015-2030,i} * E_{2015.i} * LP_{2030,i}$

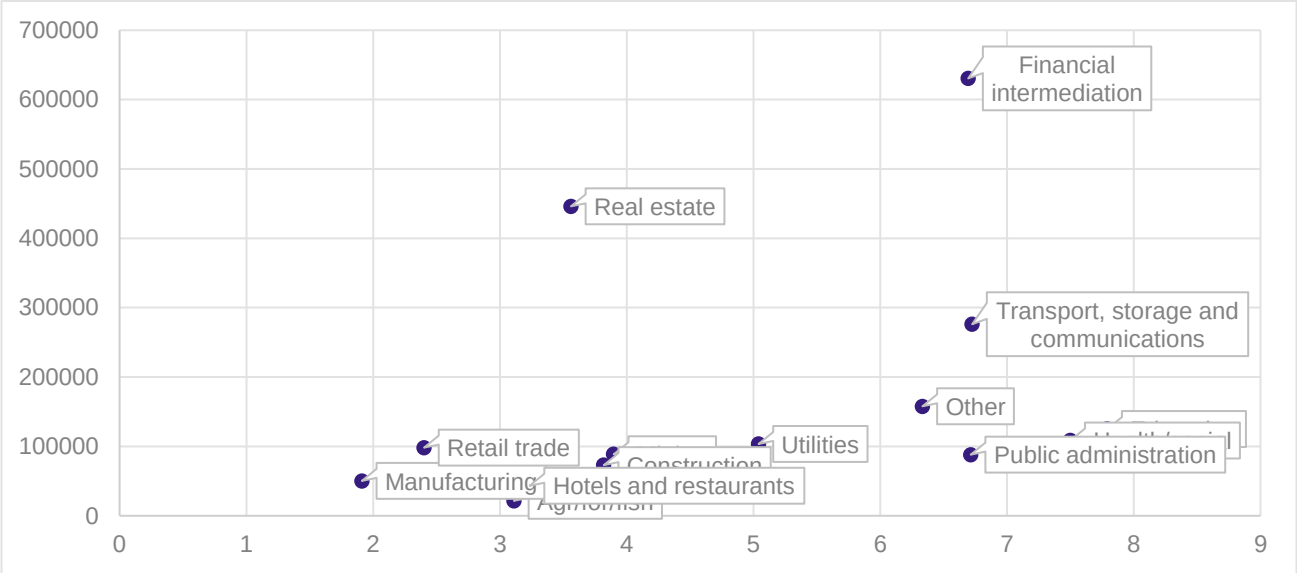
$LP_{2030,i} = LP_{2015,i} * g_{LP,i}$
$E_{2015.i}$ = *employment in sector i in 2015*

In order to calculate aggregate labour demand, we need a number of key statistics (shown in Table 11 below). Sectoral employment data are extracted from ILO WESO for 2015.[7] Gross value-added (GVA) per sector (trillion 2001 NPR) come from the Nepal Central Bureau of Statistics (CBS) national accounts data (2016). From this second set we can calculate historical GVA growth rate by sector for Nepal using data for the period 2000–2015.

We calculate labour productivity levels in 2015 by dividing GVA in a sector by the number of people employed in that sector. The data in Table 11 are reported in NPR. It is noticeable that growth has been fastest in those sectors (finance, transportation and real estate) that are least employment-intensive or with highest labour productivity. Sectors that have grown less fast (such as agriculture, manufacturing and hotels and restaurants) are among the most labour-intensive (see Figure 5). This means some structural change has taken place (see also Figure 2 in main text) and moving labour from agriculture to other sectors would raise aggregate growth (see Figure 3 in main text).

[77] These are the best possible estimates but they are lacking in precision as there has not been a labour force survey recently,

Figure 5. Faster real GVA growth (annual % growth 2000–2015, horizontal axis) in sectors with high labour productivity (or that are low employment-intensive)



Sources: See text.

The final calculated data in Table 11 are the average annual growth rate in labour productivity (in constant 2001 terms), using data for the 2000–2015 period. The whole economy GVA growth rate is 3.94% annually, whereas labour productivity is estimated at 1.55% annually. These growth rates are crucial assumptions to determine labour demand. Section 2.1 estimates that, under current growth rates for GVA and labour force, Nepal would attain lower-middle-income country (LMIC) status by 2029. Some argue that GVA growth rates should be 7–8% for Nepal to become a middle-income country (MIC) (NPC and ADB, 2016: 4), but what is probably meant is that GVA growth rates at 8% will reach $2,500 by around 2030 (in fact it is 2034, see calculations in Section 2.1, and especially Figure 1).

Table 11. Employment, value-added and labour productivity by sector, 2000–2015

Sector	2015 employment (000s)	2015 GVA (NPR billion 2001 constant)	Average annual value-added growth rate 2000–2015	2015 labour productivity (NPR 2001 constant per employed person)	Average annual labour productivity growth rate (%) 2000–2015
Agriculture	11,059	238.97	3.11	21,609	1.55
Mining and quarrying	35	3.10	3.90	88,682	7.48
Manufacturing	995	50.07	1.91	50,319	2.51
Electricity gas and water	149	15.43	5.04	103,535	9.51
Construction	592	43.24	3.82	73,046	3.10
Wholesale and retail trade	992	97.49	2.40	98,276	4.42
Hotels and restaurants	305	13.21	3.23	43,309	4.96
Transport, storage and communications	283	78.17	6.73	276,209	3.46
Financial intermediation	45	28.38	6.69	630,604	3.73
Education	397	49.66	7.79	125,099	4.19
Health and social work	106	11.50	7.50	108,491	5.13
Public administration and defence	149	13.13	6.71	88,149	3.68
Real estate, business and administration	129	57.56	3.56	446,177	8.37
Other community, social and personal service activities	193	30.47	6.33	157,855	-2.82
Whole economy	15,429		3.94	165,097	1.55

Sources: ILO WESO 2015; CBS (2015), own estimations. Data are estimates in some cases and more data have become available recently.

Using the data above we can make estimations for 2030 (highlighted in Table 12 below):

- The column '2030 GVA historic trend' calculates 2030 GVA per sector using each sector's historic growth rate for the 2000–2015 period.
- The column '2030 labour productivity historic trend' calculates the 2030 labour productivity level using each sector's historic growth rate for the 2000–2015 period.

Table 13. 2030 GVA, labour productivity and labour demand estimates using compound growth

	2030 GVA historic trend (NPR billion, 2001 constant)	2030 labour productivity historic trend (NPR 2001 constant per 000 jobs)	2030 labour demand 000 (= GVA/LABPROD)
Agriculture, forestry and fishing	378.36	27,178.6	13,921.4
Mining and quarrying	5.51	544,65.2	101.1
Manufacturing	66.51	461,41.6	1,441.5
Electricity gas and water	32.26	571,70.5	564.2
Construction	75.88	815,08.9	930.9
Wholesale and retail trade	139.18	734,17.3	1,895.7
Hotels and restaurants	21.29	33,806.7	629.9
Transport, storage and communications	207.51	440,812.8	470.8
Financial intermediation	75.00	964,222.7	77.8
Education	153.04	208,798.5	733.0
Health and social work	34.03	152,744.1	222.8
Public administration and defence	34.81	136,133.9	255.7
Real estate, business and administration	97.28	226,607.6	429.3
Other community, social and personal service activities	76.53	629,318.0	121.6
Total (unless otherwise stated)	1,397.21	64,104.8 (average)	21,795.7

Source: Own calculations based on data provided in this paper.

Using the above data, we can calculate the 2030 labour gap for the base scenario:

$$GAP_{2030} = LABSUP_{2030} - LABDEM_{2030} = 18{,}179.4 - 21{,}795.7 = -3{,}616{,}3$$

Labour demand $LABDEM_{2030}$ can be derived from dividing value-added by labour productivity at sector level. Summing over sectors suggests the aggregated labour demand in 2030 would be 21.8 million using

assumptions based on past sectoral growth rates. This compares with labour supply of approximately 18.18 million (assuming 3.0 million of net migration). The 2030 employment gap (demand greater than supply) is 3.6 million jobs by 2030 under this base scenario. Hence, if net migration goes to zero, demand matches supply approximately. What is also remarkable is that extrapolating current growth projections forward will lead Nepal to reach middle-income status by 2029 and this requires the creation of 6.4 million jobs (21.8-15.4). Below we examine sectoral growth patterns that could support job creation.

Migration could be lower than in the past because there are labour shortages and reduced demand from destination countries, but they could also be higher. Assuming no net migration of 3 million (GAP_{2030nm}) between 2015 and 2030, the gap in 000s is 0.6 million:

$$GAP_{2030nm} = 21{,}182{,}000 – 21{,}770{,}040 = - 613.600$$

Table 14 lists the key parameters and assumptions behind GAP_{2030}. Other research can vary these parameters and assess the impact on GAP. For example, a rapid increase in labour productivity change with similar overall GVA growth will require less employment.

Table 14. Key parameters and assumptions

Key parameters	Assumptions for central scenario	Alternative scenarios that could be considered
Labour force (lf) growth over 2015–2030 depending on labour force participation rates	1.95% annually (based on past growth rates between 2000 and 2015 using ILO data)	
Population growth	1.22% annually (based on past growth rates between 2000 and 2015)	
Net labour migration over 2015–2030	Annual average of 0.006% of the population (a further net 3 million workers leave Nepal)	No net migration (in text)
Growth in sectoral value addition (gGDP,i) over 2015–2030 (including implied sectoral shifts)	Past growth rate in individual sectors	Uniform growth rate across sector Calibrated growth rate
Growth in labour productivity change at sector level (gLP,i) and implied aggregate labour productivity shifts	Past growth rate in individual sectors	No productivity changes Economic transformation
Other factors not previously included	None	Shock to GDP Shock to labour demand/supply

The quantity of jobs and the gap between supply and demand at aggregate level are not the only variables of interest. We also examine how sectoral growth variations affect job creation and labour productivity – two core indicators of well-being. As sectors vary by employment intensity and labour productivity, the impact of growth on employment and labour productivity depends on which sector drives growth. The computations also suggest a trade-off between stimulating sectors that raise aggregate labour productivity and sectors that raise employment.

Table 15 applies changes to individual sectors in order to obtain a 1% aggregate GVA change. We then examine what it means for employment and labour productivity, given estimated employment intensities. If the 1% GVA growth is based entirely on the construction sector, labour demand increases by 0.79% and

labour productivity by 0.21% (the construction sector is slightly above the average productivity). The latter should also allow for an increase in wages. At the other extreme in the table, if the 1% GVA growth is based entirely on the agriculture sector, labour demand increases by 2.36% (the sector is labour-intensive), whereas aggregate labour productivity drops by 1.33%. So, lots more jobs, but of less quality and lower productivity than the economy as a whole, leading to lower aggregate wages.

Table 15. The impact of sectoral growth on employment and aggregate labour productivity

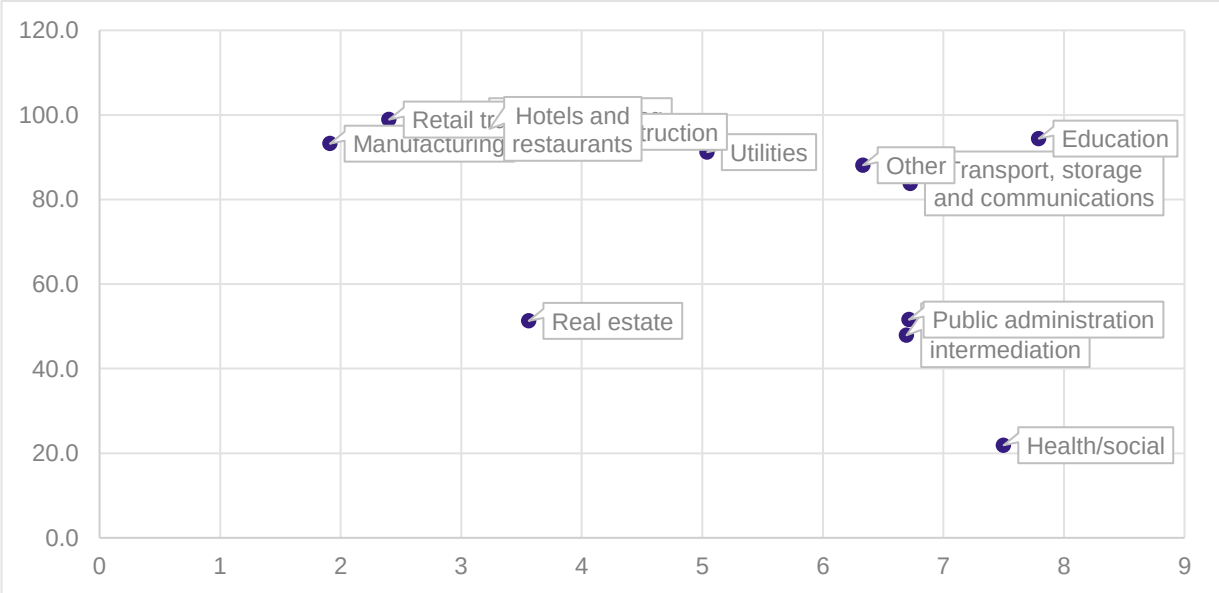
Sector	Increase in aggregate GVA	Calibrated sectoral growth required to achieve this	% change in EMP in 2030	LABPROD % in 2030
Construction	1%	18.5%	0.79%	0.21%
Manufacturing	1%	21.0%	1.39%	-0.38%
Tourism	1%	65.7%	1.90%	-0.88%
Agriculture	1%	3.7%	2.36%	-1.33%

Source: Own calculations based on data provided in this paper.

Inclusive employment

We also examine the effects of sectoral growth patterns on employment of disadvantaged groups. Female employment intensity differs by sector, and therefore different sectoral growth patterns have different effects on female empowerment. Of course, female employment intensity can change over time, which can be modelled separately. As informality differs by sector, different sectoral growth patterns have different effects on overall informality. Figure 6 shows that sectors with relatively few informal workers (as a percentage of total employment in in the sector) have grown faster. Also, as youth employment differs by sector, different sectoral growth patterns have different effects on overall youth employment. Finally, we examine rural vs. urban employment.

Figure 6. Sectors with higher shares of informal workers (% of total employment in sector, horizontal axis) grew less fast (% GVA growth, vertical axis)



Sources: See text.

Table 16 shows that agriculture and the electricity, gas and water sector employ relatively more women, whereas transport and communications employs relatively few women. The agriculture, mining and

construction sectors employ mainly rural workers; finance and electricity mainly take urban workers. Agriculture, mining, wholesale, trade and hotels and restaurants mainly employ informal workers; health, education and finance mainly employ formal workers.

Table 16. Employment intensities by sector

	% informal workers	% female workers	% urban workers
Agriculture, forestry and fishing	99.7	58.6	5.7
Mining and quarrying	99.7	29.4	11.1
Manufacturing	93.2	40.7	27.7
Electricity gas and water	91.2	66.0	29.4
Construction	96.0	10.6	20.4
Wholesale and retail trade	98.9	34.8	38.2
Hotels and restaurants	96.7	49.1	47.2
Transport, storage and communications	83.8	3.9	32.8
Financial intermediation	47.9	31.7	62.5
Education	94.4	16.2	30.9
Health and social work	21.9	11.6	39.0
Public administration and defence	51.6	32.4	49.5
Real estate, business and administration	51.3	40.4	50.7
Other community, social and personal service activities	88.1	29.6	44.4
Average (unweighted)	79.6	32.5	35.0

Sources: Labour Force Survey and other sources.

We run a number of scenarios. We first raise growth by 1% by adding NPR 14 trillion (2001 prices) to 2030 GVA, or NPR 1 trillion to each of the 14 sectors identified above. We then raise growth by 1% by adding NPR 14 trillion to only one sector: first agriculture, then manufacturing, construction and tourism. A 1% increase in GVA that comes from all sectors equally would lead to 0.13 million more jobs, but if the increase in GVA came from manufacturing this would lead to 0.22 million jobs; construction 0.17 million; tourism 0.41 million; and agriculture 0.52 million.

As Table 17 shows, a 1% increase in GVA that comes from all sectors equally would lead to 0.07 million more female jobs, but if the increase in GVA came from manufacturing this would lead to 0.12 million female jobs; construction 0.02 million; tourism 0.20 million; and agriculture 0.30 million. A 1% increase in GVA that comes from all sectors equally would lead to 0.07 million more rural jobs, but if the increase in GVA came from manufacturing this would lead to 0.14 million rural jobs; construction 0.02 million; tourism 0.22 million; and agriculture 0.49 million.

We also examine a further scenario that lowers growth in all sectors by 10%. This leads to a fall in employment of 1 million.

Table 17. Sectoral growth pattern and employment of disadvantaged groups

	Total emp.	Female emp.	Rural emp.	Informal emp.	Total emp.	Female emp.	Rural emp.	Informal emp.
Scenario	**% difference from base**	**% difference from base**	**% difference from base**	**% difference from base**	**Absolute difference (million)**	**Absolute difference (million)**	**Absolute difference (million)**	**Absolute difference (million)**
1% increase in total GVA equally divided over all sectors	0.82%	0.70%	0.70%	0.77%	0.18	0.07	0.13	0.16
1% increase in total GVA through manufacturing	1.39%	1.15%	1.20%	1.36%	0.30	0.12	0.22	0.28
1% increase in total GVA through construction	0.79%	0.17%	0.75%	0.79%	0.17	0.02	0.14	0.16
1% increase in total GVA through tourism	1.90%	1.90%	1.19%	1.92%	0.41	0.20	0.22	0.40
1% increase in total GVA through agriculture	2.36%	2.82%	2.65%	2.46%	0.52	0.30	0.49	0.51
10% lower growth in each sector	-4.81%	-4.54%	-4.72%	-4.71%	-1.05	-0.49	-0.86	-0.98
Addendum (base, absolute)	21,795.7	10,687.8	3,491.6	20,847.9				

Source: Own calculations based on data provided in this paper.

Further research could examine youth employment in greater detail. Data on employment of young people by sector are scarce, but those surveys that do exist suggest young people are represented relatively more in the following sectors: trade, transport and communications, education and health, financial intermediation; and relatively little in agriculture, utilities and real estate. They are about average in manufacturing, construction, public administration, hotels and restaurants. Hence, growth from information and communication technology (ICT) may be relatively good for young people, but the reverse is true for agriculture.

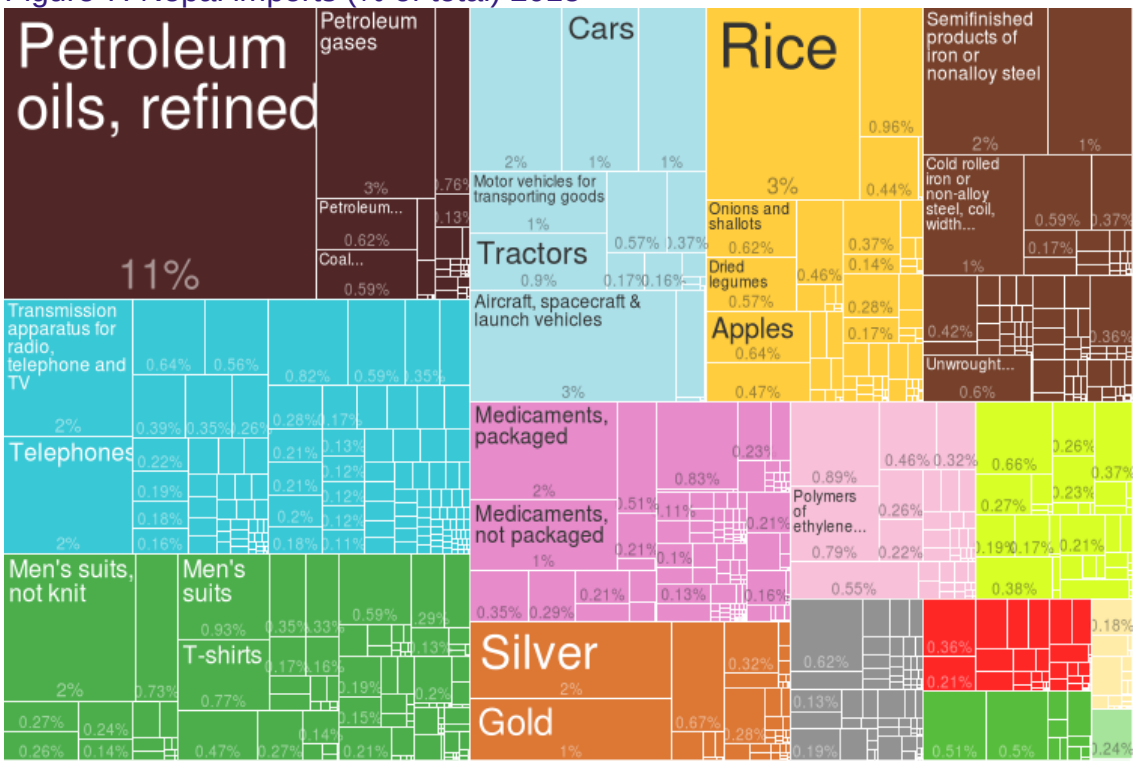
The importance of sectoral growth patterns for economic transformation and inclusive job creation: Summary

Nepal has ambitious targets for its growth rate and income levels, aiming to graduate from least developed country (LDC) status by 2022 and become an MIC by 2030. It is important to examine the sectoral picture behind this. The draft text above suggests a number of issues:

- Projecting past growth rates (over 2000–2015) in population and GVA to 2030 suggests Nepal can reach LMIC status by 2029. This requires the creation of 6.1 million jobs, of which 3.1 million are needed simply to keep up with population growth (or 5.2 if we take into account labour force growth).
- Projecting labour supply and demand forward on the basis of past growth rates in GVA and labour productivity leads to a labour deficit of around 3.6 million by 2030. This also assumes net migration carries on as usual. If there is zero net migration by 2030, the labour deficit is 0.6 million. Of course, lower GVA growth, for example a shock of 10% across all sectors, would lower employment by 1 million, leading to a labour surplus of 0.4 million.
- It is important to consider the impact of sectors on growth. For example, current data suggest growth in the construction sector has raised aggregate labour productivity but does not increase labour demand that much compared with in agriculture, which has lower labour productivity. Manufacturing and hotels and restaurants are in between.
- In terms of female employment, agriculture and utilities are proportionally employing more women, whereas transport and communications employ very few women. Manufacturing and tourism are in between.

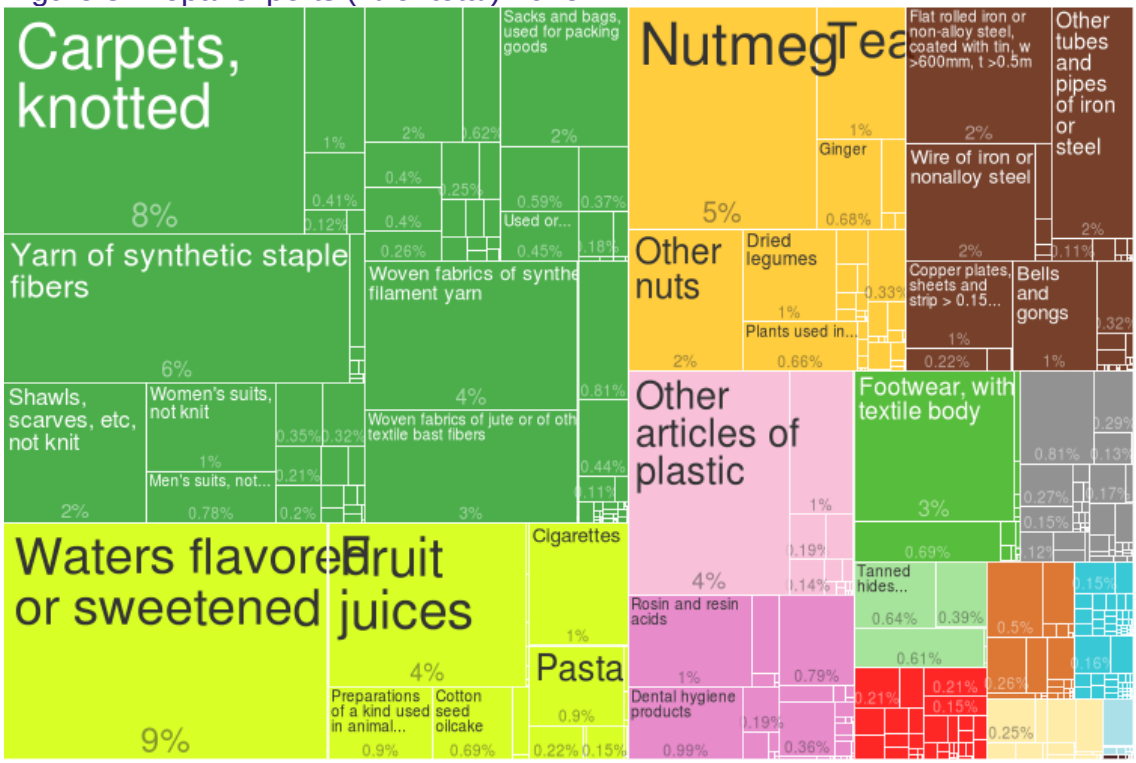
APPENDIX B: TABLES AND FIGURES

Figure 7. Nepal imports (% of total) 2015



Source: 'The Atlas of Economic Complexity', Center for International Development at Harvard University (http://www.atlas.cid.harvard.edu).

Figure 8. Nepal exports (% of total) 2015



Source: 'The Atlas of Economic Complexity', Center for International Development at Harvard University (http://www.atlas.cid.harvard.edu).

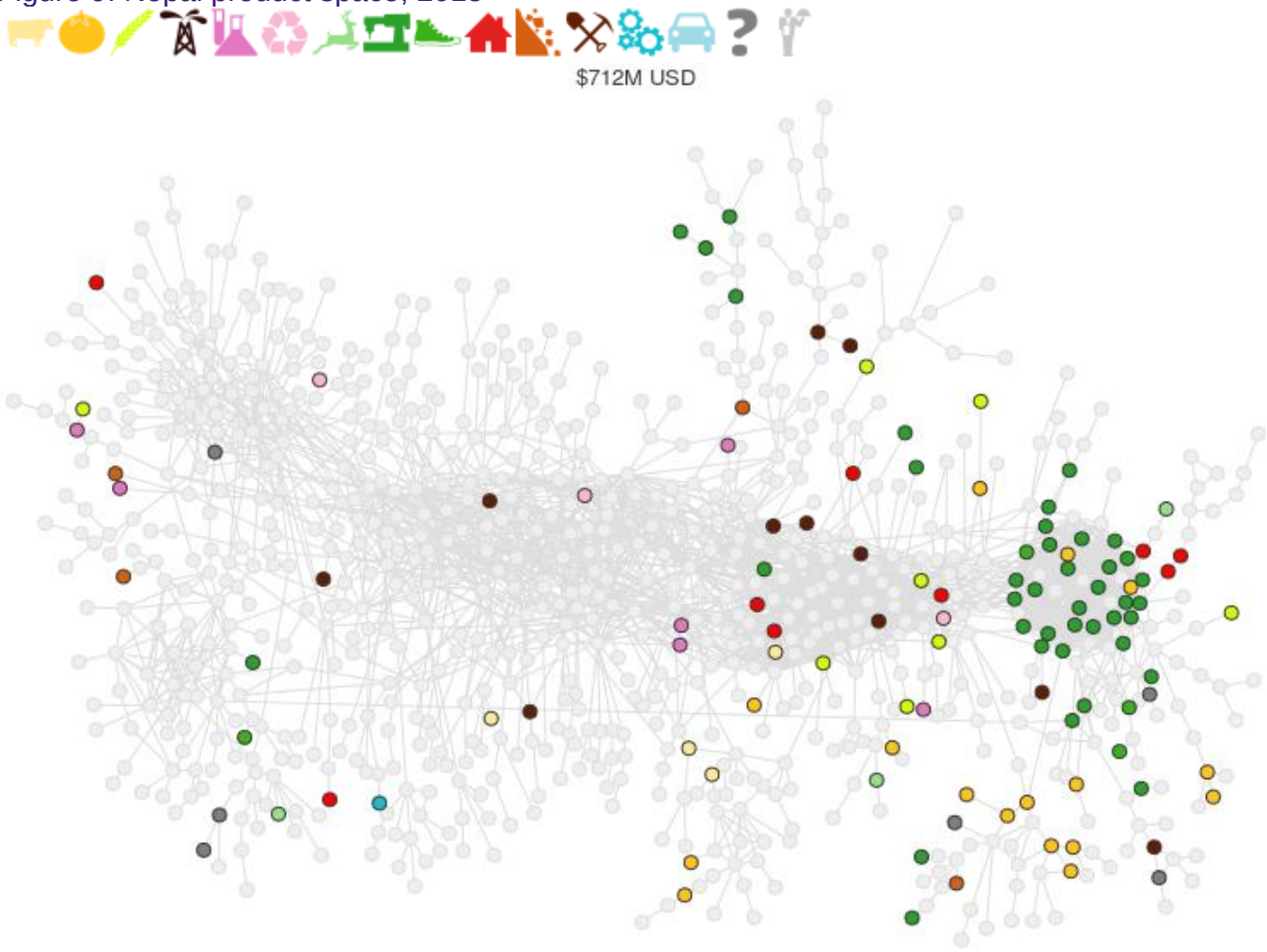
Table 18. Revealed comparative advantage by HS Section, Nepal 2009 - 2016

HS Sect.	Product label	2009	2010	2011	2012	2013	2014	2015
	Total in HS 1-97	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**
1	Live animals; animal products	0.20	0.17	0.41	0.88	0.70	0.56	0.56
2	Vegetable products	6.78	6.61	5.16	6.26	4.40	5.62	5.65
3	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes	1.58	0.80	0.51	0.43	0.54	0.27	0.22
4	Prepared foodstuffs; beverages, spirits and vinegar; tobacco and manufactured tobacco substitutes	2.12	1.89	2.21	2.43	3.06	3.20	3.14
5	Mineral products	0.22	0.07	0.09	0.07	0.06	0.11	0.00
6	Products of the chemical or allied industries	0.44	0.42	0.55	0.51	0.56	0.54	0.50
7	Plastics and articles thereof; rubber and articles thereof	0.65	0.57	0.41	0.49	0.45	0.35	0.33
8	Raw hides and skins, leather, furskins and articles thereof; saddlery and harness; travel goods, handbags and similar containers; articles of animal gut (other than silk-worm gut)	1.57	2.11	2.32	3.11	2.93	2.80	2.38
9	Wood and articles of wood; wood charcoal; cork and articles of cork; manufactures of straw, of esparto or of other plaiting materials; basketware and wickerwork	0.43	0.87	0.40	0.50	0.48	0.30	0.20
10	Pulp of wood or of other fibrous cellulosic material; recovered (waste and scrap) paper or paperboard; paper and paperboard and articles thereof	0.42	0.49	0.51	0.55	0.75	0.69	0.77
11	Textiles and textile articles	7.95	9.09	9.70	8.88	9.29	8.78	8.69
12	Footwear, headgear, umbrellas, sun umbrellas, walking-sticks, seat-sticks, whips, riding-crops and parts thereof; prepared feathers and articles made therewith; artificial flowers; articles of human hair	1.62	2.59	4.03	3.75	4.33	3.43	3.51
13	Articles of stone, plaster, cement, asbestos, mica or similar materials; ceramic products; glass and glassware	0.21	0.46	0.37	0.52	0.77	0.51	0.50
14	Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with precious metal and articles thereof; imitation jewellery; coin thereof; imitation jewellery; coin	0.37	0.19	0.15	0.02	0.03	0.04	0.05
15	Base metals and articles of base metal	2.31	2.59	2.46	2.58	2.57	2.20	1.71
16	Machinery and mechanical appliances; electrical equipment; parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles	0.03	0.06	0.04	0.04	0.03	0.01	0.02
17	Vehicles, aircraft, vessels and associated transport equipment	0.01	0.03	0.01	0.01	0.00	0.03	0.00
18	Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus; clocks and watches; musical instruments; parts and accessories thereof	0.08	0.05	0.11	0.06	0.09	0.06	0.15
19	Arms and ammunition; parts and accessories thereof	0.13	0.46	0.43	0.05	0.23	6.14	0.11
20	Miscellaneous manufactured articles	0.24	0.12	0.20	0.23	0.21	0.19	0.12
21	Works of art, collectors' pieces and antiques	15.30	8.80	7.03	5.47	6.78	6.82	5.98

Note: Share of country's exports in each HS Section in country's total exports as a ratio of share of world exports in each HS Section in world total exports. 'World' = an aggregate of all countries reporting to UN COMTRADE's in any given year.

Source: Authors' calculations using data from the UN's COMTRADE database.

Figure 9. Nepal product space, 2015



Source: 'The Atlas of Economic Complexity', Center for International Development at Harvard University (http://www.atlas.cid.harvard.edu).

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Xu, J. and Hager, S. (2017) 'Applying the Growth Identification and Facilitation Framework to Nepal'. CDP Background Paper 35, April.

List of companion papers for this study

The Nepal labour market: A four sector case study (October 2017) *Supporting Economic Transformation Programme, London: ODI.*

Henley, G. (October 2017) Pathways to prosperity and inclusive job creation in Nepal: Background Paper - Agro-processing sector, *Supporting Economic Transformation Programme, London: ODI.*

Hoque, S. (October 2017) Pathways to prosperity and inclusive job creation in Nepal: Background Paper -Tourism sector, *Supporting Economic Transformation Programme, London: ODI.*

Lemma, A. (October 2017) Pathways to prosperity and inclusive job creation in Nepal: Background Paper -Light Manufacturing sector, *Supporting Economic Transformation Programme, London: ODI.*

Lemma, A. (October 2017) Pathways to prosperity and inclusive job creation in Nepal: Background Paper - ICT sector, *Supporting Economic Transformation Programme, London: ODI.*