Infrastructure Needs of Nepal, Investment Requirements and Financing

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What is infrastructure ?

- **Hard Infrastructure**

A wide range of facilities and services such as water supply, sewers, power grids, and telecommunications, as well as transport infrastructure, such as roads, tunnels, and bridges

- **Soft infrastructure**

Institutions, such as health care, education, or financial systems.

- **Present context**

This presentation focuses on hard infrastructure, especially transport infrastructure, electricity, urban infrastructure, and telecommunications

Characteristics/concepts of Infrastructure

- Physical characteristics (e.g., roads, bridges, pipelines, and cables);
- Sectors (including economic infrastructure sectors such as transport, energy, water, and waste, and sometimes also social infrastructure, such as education and health);
- Public and private infrastructure (new projects versus maintenance);
- Economic characteristics (e.g., monopolies, networks, scale, and barriers to entry);
- Regulatory regimes (e.g., for utilities and airports);
- Contractual approaches (e.g., project finance, PPP, and concessions); and
- Investment characteristics (e.g., long-term, stable cash flows, inflation protection, and relatively low default rates).

Why Infrastructure Development?

- Adequate and efficient national infrastructure is a fundamental requirement of a well-functioning economy. It is estimated that one percent of GDP growth requires investment of at least one percent of its GDP invested in infrastructure.
- Infrastructure provides the assets and services that facilitate trade and exchange within an economy, increase output capacity, improve productivity, reduce congestion, and lower public and private transaction costs.
- Better infrastructure facilitates international trade by reducing transportation costs.
- Infrastructure is also essential to provide basic services to public and thus it increases standard of living.

Infrastructure investment in Asia and the Pacific Region

- 29.0% of GDP in Indonesia,
- 21.0% in Thailand,
- 19.0% in Viet Nam,
- 15.0% in the Philippines,
- 8.5% in the People's Republic of China (PRC), and
- 4.7% in India

For Asia and the Pacific region, funding requirement estimated at around $800 billion annually (Moore and Kerr 2014. Currently, the Asia and Pacific region spends about $360 billion on transport each year).

Infrastructure Investment Needs, 2010–2020 (% of GDP)

	Energy	Transport	Telecom	Water and Sanitation	All sectors
East and Southeast Asia	3.2	1.6	0.5	0.2	5.5
South Asia	3.0	5.6	2.0	0.4	11.0
Central Asia	3.0	1.9	1.4	0.4	6.6
Pacific	0.0	2.6	0.7	0.3	3.6
All Developing Asia	3.2	2.3	0.8	0.2	6.5

GDP= gross domestic product, Telecom = telecommunications.
Source: Bhattacharyay (2012).

Annual Infrastructure Investment Needs as a percent of Estimated GDP (2010-2020)

	The World Bank Estimates					
Country/ Region	**Transport**	**Electricity**	**ITC**	**Water and Sanitation**	**Irrigation**	**Total**
Nepal (percent of GDP)	2.3-3.5	3.3-4.5	0.3-0.4	1.1-1.6	1.0-1.5	8.2-11.8
USD billion by 2020	3.7-5.5	5.3-7.0	0.4-0.6	0.4-0.5	1.6-2.3	13-18

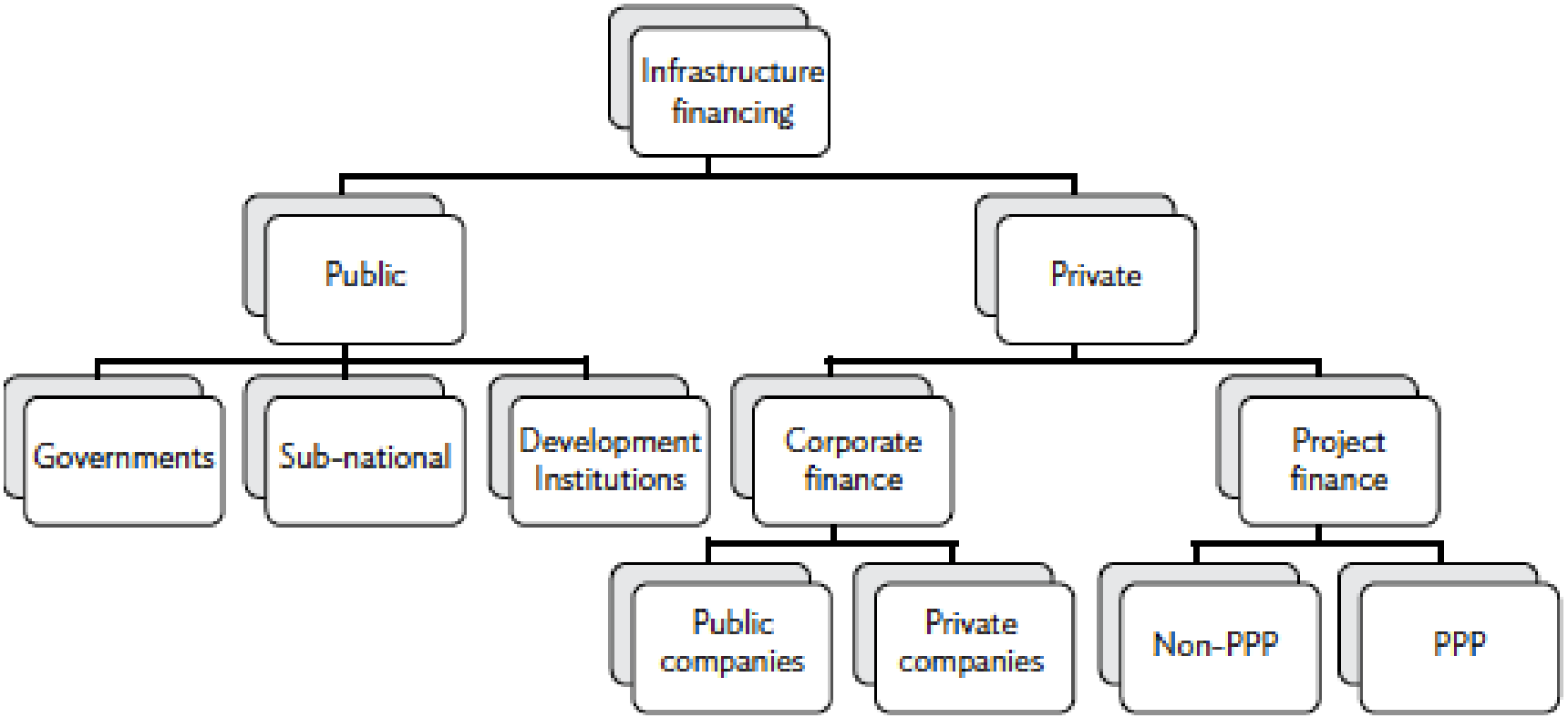
	ADB Estimates				
Country/ Region	**Transport**	**Electricity**	**ITC**	**Water and Sanitation**	**Total**
Nepal (percent of GDP)	1.65	0.58	5.14	1.10	8.48
South Asia (including India)	5.55	3.03	2.02	0.39	11.00

Source: (Andres, et al., 2014), (Bhattacharya, 2010), and (Ahmed, et al., 2012).

Capital expenditure by infrastructure sectors as % of GDP (2009-2016)

	2009	2010	2011	2012	2013	2014	2015	2016
Drinking Water	0.69	0.56	0.52	0.52	0.45	0.62	0.64	0.68
Communication	0.04	0.04	0.03	0.02	0.02	0.03	0.02	0.02
Transportation	1.21	1.77	1.72	1.62	1.40	1.55	2.29	2.87
Electricity	0.74	1.30	0.96	0.01	0.01	0.87	1.72	1.69
Total	**2.7**	**3.7**	**3.2**	**2.2**	**1.9**	**3.1**	**4.7**	**5.3**

Sources of Infrastructure financing



PPP = public–private partnership.

Methods of Public Infrastructure Financing

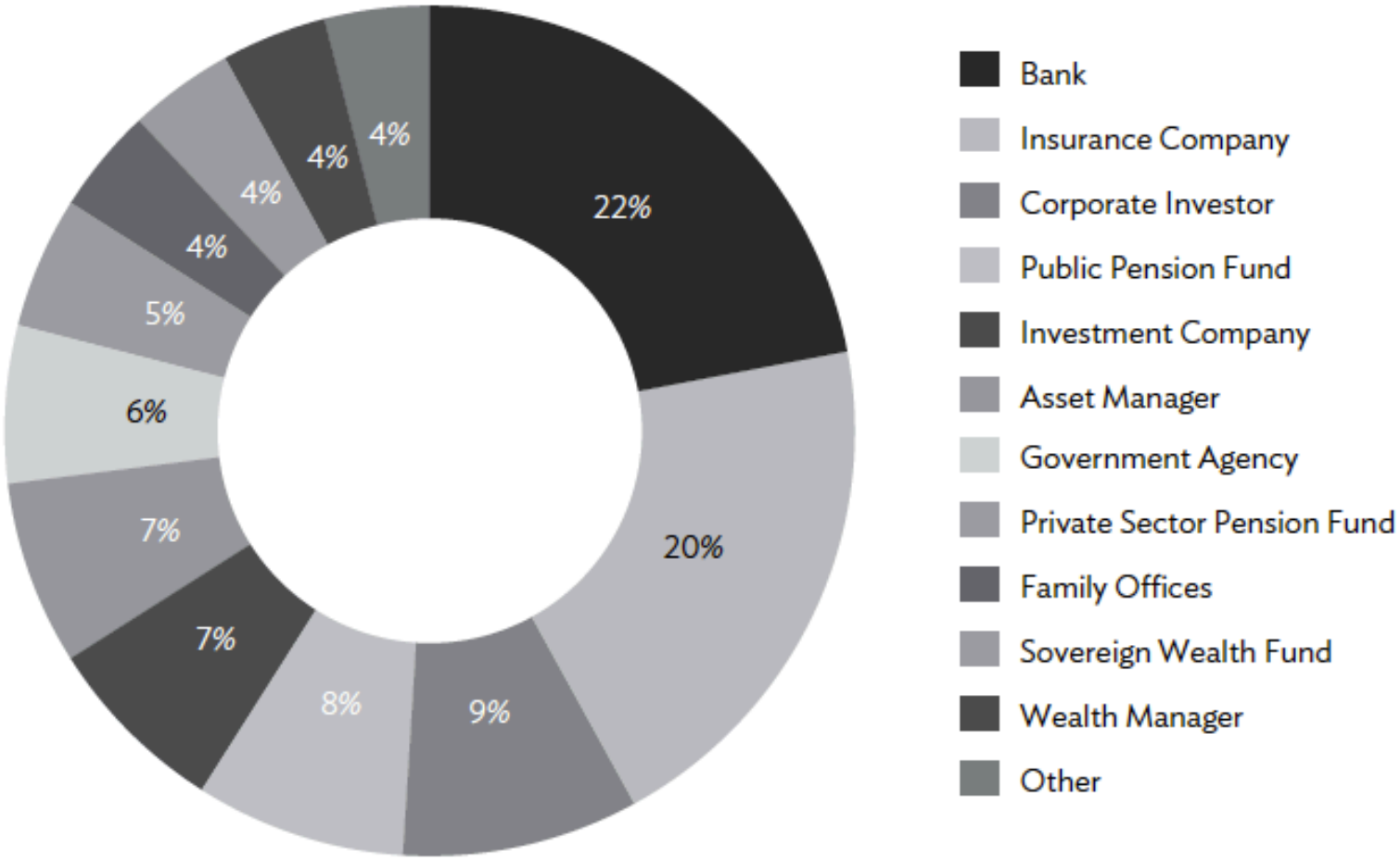
(i) An economy-wide increase in direct and indirect taxes,

(ii) Raising of a tax or levy confined to a province or local government area

(iii) Dedication of existing taxes to specific investment objectives (such as applying fuel taxes to road construction and maintenance

iv) Public debt - public borrowings, overseas development assistance loans, and the sale of bonds.

Asia-Based Infrastructure Investors, 2015

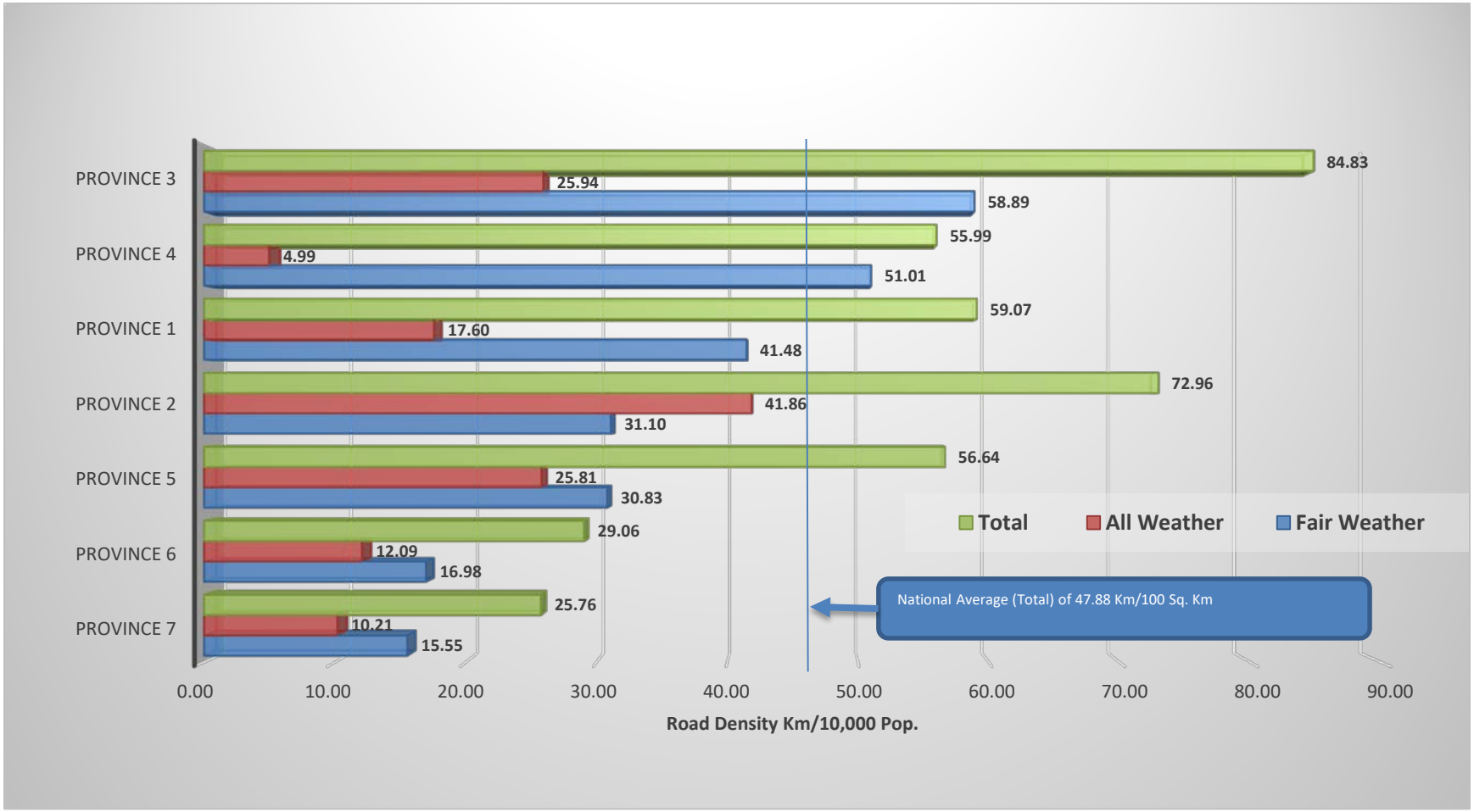


A **sovereign wealth fund** (SWF) or **sovereign** investment **fund** is a state-owned investment **fund** that invests in real and financial assets such as stocks, bonds.
Source: Preqin 2015. Asian Infrastructure. Preqin Special Report, June 2015.

Status of Infrastructure

- Out of total 26,935 Km SRN Nepal's road network 11,349 km is paved, 6,192 km is graveled, and 9,394 km are earthen (fair) weather roads
- Total installed capacity of Electricity 1073 MW, Public Sector generation 562 and private sector generation 511 MW Peak Load 1300 MW Import from India 450 MW. Installed capacity of Renewable energy 55 MW.
- Telephone subscribers of NDCL in July 2018 are 19,980,520 and of Ncell 16,513,859 .
- National sanitation coverage 96.3 % and

Road Density by Provinces



Railway line in Terai Area

Railway line from China

Needs Assessment of SDG 6 (Water and Sanitation)

Targets and Indicators	2015	2019	2022	2025	2030
Household with access to piped water supply (%)	49.5	60.3	68.4	76.5	90
Households with basic water supply coverage (%)	87	90.2	92.6	95	99
Population using safe drinking water (%)	15	35	50	65	90
Open Defecation Free Area declared (%)	41	56.5	71.9	83.5	99
Sanitation coverage (%)	70	77.7	77.5	83.3	99
Proportion of untreated domestic waste water (%)	99	89.9	83.1	76.3	65
Proportion of untreated industrial waste water (%)	99	75.3	57.5	39.7	10

Sources: SDGs Baseline Report 2017

Needs Assessment of SDG 7 (Energy)

Targets and Indicators	2015	2019	2022	2025	2030
Electricity consumption (kWh per capita)	80	458.7	742.7	1026.7	1500
Share of renewable energy in total energy (final) consumption (%)	11.9	22.1	29.7	37.3	50
Installed capacity of hydropower (MW)	782	4573	7417	10260	15000
Grid connected to solar PVC (MW)	0.10	266.7	466.7	666.7	1000
Energy efficiency in Industry (MJ per 1000 rupees of product)	47.20	45.28	43.84	42.40	40
Efficient lighting systems LED (in residential & commercial), (%)	0.1	7.6	15.0	50.0	100

Sources: SDGs Baseline Report 2017

Needs Assessment of Infrastructures for Nepal

Targets and Indicators	2017	2030
Road density (km/sq km)	1.3	5
Paved road density (km/sq km)	0.017	0.119
Availability of safe public transport (%)	9.5	50
Access to a road within 30 minutes of walking	56.8	80
Urban population living in squatters (%)	6	0.1
Households living in safe houses (%)	35.5	60
Planned satellite cities (number)	18	50
Municipalities with sewerage services (%)	72	100
Tele-density (no. of telephone connections for every 100 individuals living in an area)	90.7	100

Public Finance Requirement by sectors in Nepal (Rs in billion)

SDG areas	Total Investment requirement	Share of Public investment in Total Investment	Public Investment Requirement	Available public finance (Domestic)	Available public finance (ODA)	Financing gap in public sector
Water and Sanitation	1155.4	82.3	950.7	409.4	230.1	311.2
Energy	3131.7	48.4	1514.6	491.6	464.1	558.9
Transport, Industry and ICT	7640.8	33.4	2555.8	1494.9	288.7	772.2
Urban Infrastructure	2554.2	35.4	903.7	411.1	268.5	224.1

Source: Estimation of the research team.

Public Finance Requirement by sectors in Nepal (Rs in billion)

SDG areas	Total Investment requirement	Share of Private investment in Total Investment	Private Investment Requirement	Available Private finance (inc. FDI)	Available Private Finance (FDI)	Financing gap in private sector
Water and Sanitation	1155.4	8.1	93.1	58.4	5.5	34.8
Energy	3131.7	45.4	1423.0	502.0	112.7	921.0
Transport, Industry & ICT	7640.8	58.0	4431.7	3014.5	104.5	1417.2
Urban Infrastructure	2554.2	54.1	1380.7	270.6	11.0	1110.2

Risks in investment

i. Construction and development risks of projects;
ii. Operational, demand, and market risks (e.g., changing traffic numbers);
iii. Financial and interest rate risks;
iv. Governance standards (e.g., bureaucracy, and corruption);
v. Legal, social, and reputational risks (e.g., delays, failures, and environmental issues);
vi. Regulatory risks (e.g., changing regulation, cuts in subsidies, and investor regulation); and
vii. Political uncertainty (e.g., changes in government or infrastructure policies, and expropriation risk).

Thank you