



Hydropower Development and Foreign Investment in Nepal

Udaya Raj Sapkota
Ministry of Energy
Govt. of Nepal



Outline

Hydropower in Nepal
Hydropower Development Policy
Hydropower Projects
Transmission
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Nepal's Exceptions



Hydropower in Nepal

- Nepal has more than 6000 rivers
- Nepal has the potential about 83,000 MW and 43,000 MW is economically viable
- Government has an accepted strategy for hydro development and is open for business
- Exporting power is also in a high priority
- Development of Hydro is the key economic indicator



Hydropower in Nepal

- First Hydro development – more than 100 years ago
- But in reality 12 hrs Power Cut in dry Season
- Imported from India
- Approximately 1.2 million dollar invested – by present value
- After 2016 surplus in wet and power cut in dry
- Need storage project otherwise to be imported from India



Major Hydropower in Nepal

In Operation Major (NEA)

- Pharping- Nepal (First HP Project)
- Kaligandaki – 144 MW (ADB+JICA+WB)
- Middle Marsyangdi – 70 MW (KFW)
- Khulekhani – 92 MW (WB+Japan+Kawait)
- Marsyangdi – 60 MW (KFW)
- Trishuli, Devighat -India
- Panauti – Russia
- Chilime- 22 MW NEA



Major Hydropower in Nepal

In Operation Major (Private Sector)

- Bhotekoshi - 45 MW USA
- Khimti - 60 MW Norway

In Construction

- Upper Tamakoshi- 456 MW Local Fund NEA
- Upper Trishuli 3A- 60 MW Chinese
- Upper Marsyangdi – 50 MW Chinese
- Chameliya – 30 MW Korean
- Mai Khola - 21 MW Local + NRN

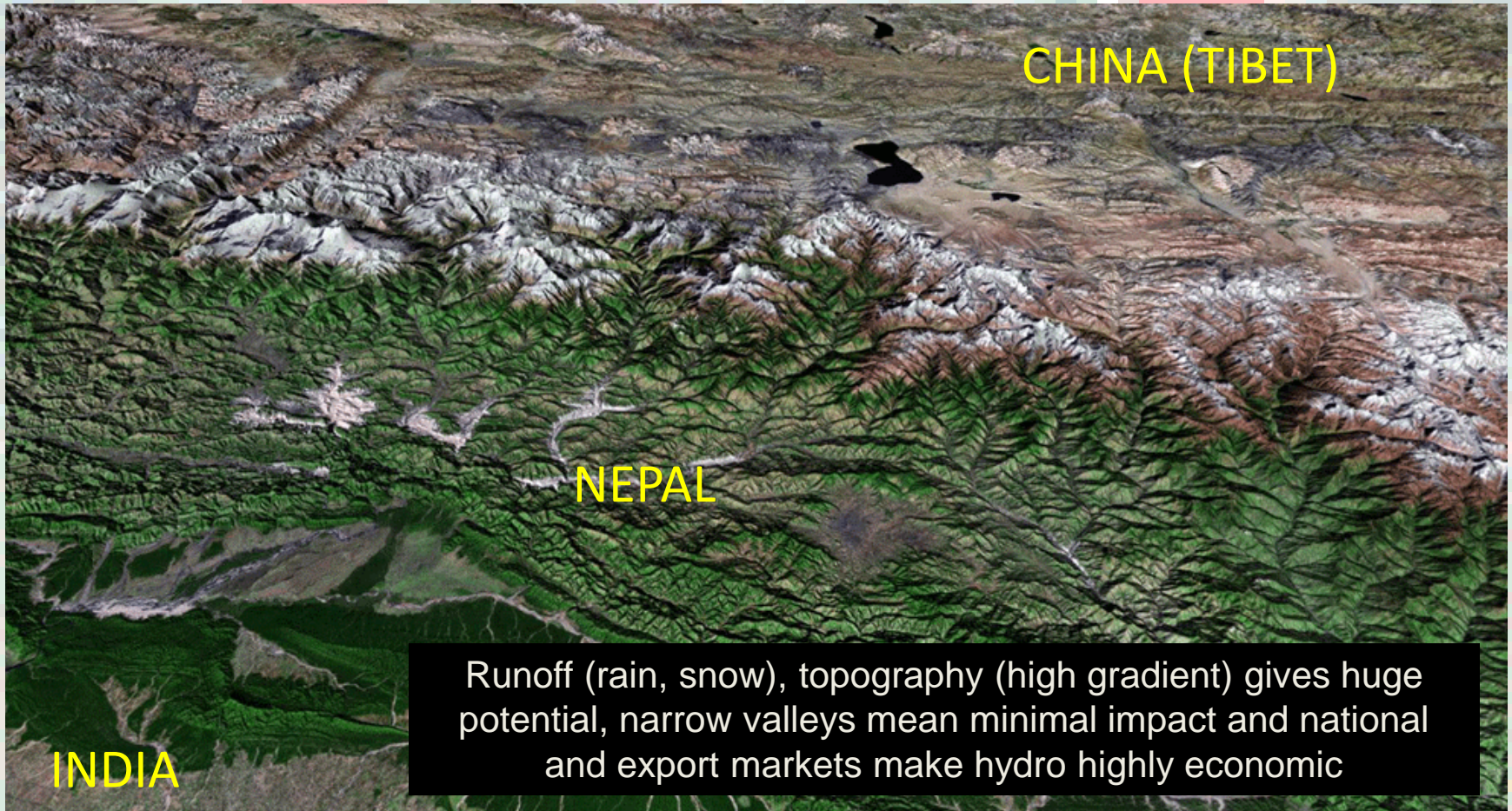
Generation License provided

- Rasuwa Ghadi, Middle Bhotekoshi, Sanjen, Lower Solu, Solu, Khare etc.



**A renewable resource endowment
with national and adjacent markets**

Relative advantage of Hydropower in Nepal



The Opportunity



- Nepal rivers have 4 times the water flow in the wet summer months compared to winter; challenge is to find export markets on favourable terms for enormous summer surpluses from major run of river projects, develop projects with storage to meet domestic and export market daily and seasonal peaking needs, selective imports during dry winter season to take advantages of complementarities between Nepal's hydro based system and India's predominantly coal based system.

Strategy



- **Develop large scale RoR projects with foreign investment to serve both local and export market**
- **Smaller scale projects which can be developed more quickly and are more within the capability of local private sector to finance and build will be targeted on meeting Nepal needs**
- **Mid scale projects being done by Govt. entity with private partners**
- **Promote storage projects to enable seasonal peaking needs to be met from domestic resources-also multipurpose**
- **Major investments in cross border and backbone transmission to enable imports throughout the year until export projects begin coming on, then serve for export and seasonal and peaking power exchange**

Present Status



Total System Demand- summer peak of x compared to summer supply of y ; winter peak of x compared to winter supply of y

System demand is growing at $x\%$ per year or 70 MW

Domestic demand by 2015= x MW and by 2020= y MW

Hydro Generation Capacity (present)	750 MW
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Under construction projects (Gen. License Provided)	2,354 MW
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About to go for construction (Apply for the Gen. L)	5,189 MW
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About to go for construction (export)	4,000 MW
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Others (at various stage of Survey)	5,000 MW
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Announced Targets



Over the past ten years, several different targets for power development have been announced by the Assembly or by Government.

NATIONAL WATER PLAN

by 2027

Domestic demand	4000 MW
Per capita consumption	400 kWh
Export	Extensive

Interim Plan

By year 2015 to add	2500 MW
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Current Target of the government

Within 10 Years	10000 MW
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Resources



Investment required for

Interim Plan target

to add 2500 MW by 2015

= 5 billion USD

Government's target

10,000 MW within 10 Years

= 20 billion USD

Exchange Rate about 100 NPR= 1 USD

Policy



Objectives of HDP 2001;

- **generate electricity at low cost**
- **reliable and quality electricity at reasonable price**
- **combine electrification with the economic activities**
- **development of rural electrification**
- **develop hydro-electricity as an exportable commodity**

Policy



Procedures under HDP 2001;

- **Projects to be developed through competitive bidding**
- **BOOT model for private investment**
- **GoN may participate in multipurpose projects**
- **High standards for environment protection**
- **GoN will facilitate land acquisition**
- **royalty structure – Fix rate upto 1000 MW export project**
- **Negotiable rate above 1000 MW**
- **Separate Agreement -Developers and GON**

Policy



Commitments of GoN;

- **Survey License – 5 yrs**
- **generation license for 35 years for domestic supply; and 30 years for export oriented projects**
- **additional five years in max for hydrological risks**
- **project turned over free of cost in good operating condition at the end**
- **water rights guaranteed**
- **no nationalization**
- **foreign exchange and repatriation facility**

Policy



- **Institutional arrangement**
 - ❖ **Electricity Tariff Fixation Commission**
 - ❖ **DoED acts as a promotional body**
 - ❖ **WECS to conduct load forecast and policy research works**

Policy



➤ provisions

- ❖ **Some financial facilities like Tax Holiday, VAT Exemption etc.**
- ❖ **working permits/visa for expatriates and family**
- ❖ **Concession agreements as required**
- ❖ **Security forces could be deployed at project sites**



Recent new initiatives:

- **Loss reduction drive**
- **Hydropower Investment and Development Company**
- **Focus on transmission network expansion**
- **Initiating Reservoir projects**
- **Separate entity for rural electrification**
- **Channeling funds from small investors/NRNs**
- **Involvement of Community in distribution encouraged**

Proposed New Legislation



New enactments in line:

- **Electricity Act**
- **Nepal Electricity Regulatory Commission**

The new act will also allow trading of power as an independent business and for this a new licensing regime will be established.



Projects with involvement of international investors for domestic market at advanced stage:

- **Lower Solu project (80 MW) Gen. License provided**
- **Marsyangdi project (50 MW) in the Construction**
- **Kabeli project (37 MW) Gen. License provided**
- **Likhu PRoR project (120 MW) Gen. License provided**



Domestic Market Projects

Storage for seasonal and peaking needs:

- **Upper Seti (Damauli) reservoir project (127 MW) Study JICA+ADB**
- **Aandhi Khola Reservoir Project (170 MW) Study**
- **Budhigandaki Reservoir Project (600 MW) Study**
- **Nalsyaugad Reservoir Project (400 MW) Study**

Some Others:

- **Upper Arun RoR Project (335 MW) Study WB**
- **Simbuwa RoR Project (80 MW)**
- **Dudhkoshi RoR Project (40 MW)**
- **Budhiganga RoR project (20 MW) Study Saudi Fund**
- **West Seti (750 MW) MOU with Three Grazes China**

Projects



Export power projects to be developed by international developers (PDA);

- **Upper Karnali PProR project (900 MW): GMR (India)**
- **Tamakoshi-3 PProR Project (650 MW): SN Power (Norway)**
- **Arun III PProR Project (900 MW): Sutluj (India-public)**
- **Upper Marsyangdi ROR Project (600 MW)): GMR (India)**
- **Upper Trishuli 1- (216 MW) NWEDC-Korea**

And many more are at study stage



Cross border transmission lines, and strengthening transmission backbone, are priorities:

- **There are 21 interconnections with India (mostly 33 kV or 11 kV)**
- **These interconnections are grossly inadequate to wheel the quantum of power which is expected to be imported / exported to/from Nepal.**
- **Lack of Investment in the development of HV transmission is huge barrier to power development**
- **Transmission projects that facilitate power trade with India are planned for implementation**
- **Proposed cross border transmission links are: 400 KVA**
 - (i) Dhalkebar – Muzaffarpur In the Construction**
 - (ii) Butwal – Gorakhpur**
 - (iii) Duhabi – Purnea**
 - (iv) Anarmani – Silguri**



Contd/.....

- **Muzzaffarpur in India and Dhalkebar in Nepal 400 kV double circuit (D/C) line now proceeding**
 - **Expected to be commissioned in future. This transmission line will be used to export hydro-energy**
- Remaining three proposed cross border projects will need to be in place by 2020 to accommodate the proposed 3500 MW of export projects.**
- Nepal and India discussing on Power Trade Agreement.**



Projects

Pancheshwar
(5000)

Upper
Karnali (900)

Nalsyaugad
(400)

Budhi
Gandaki (600)

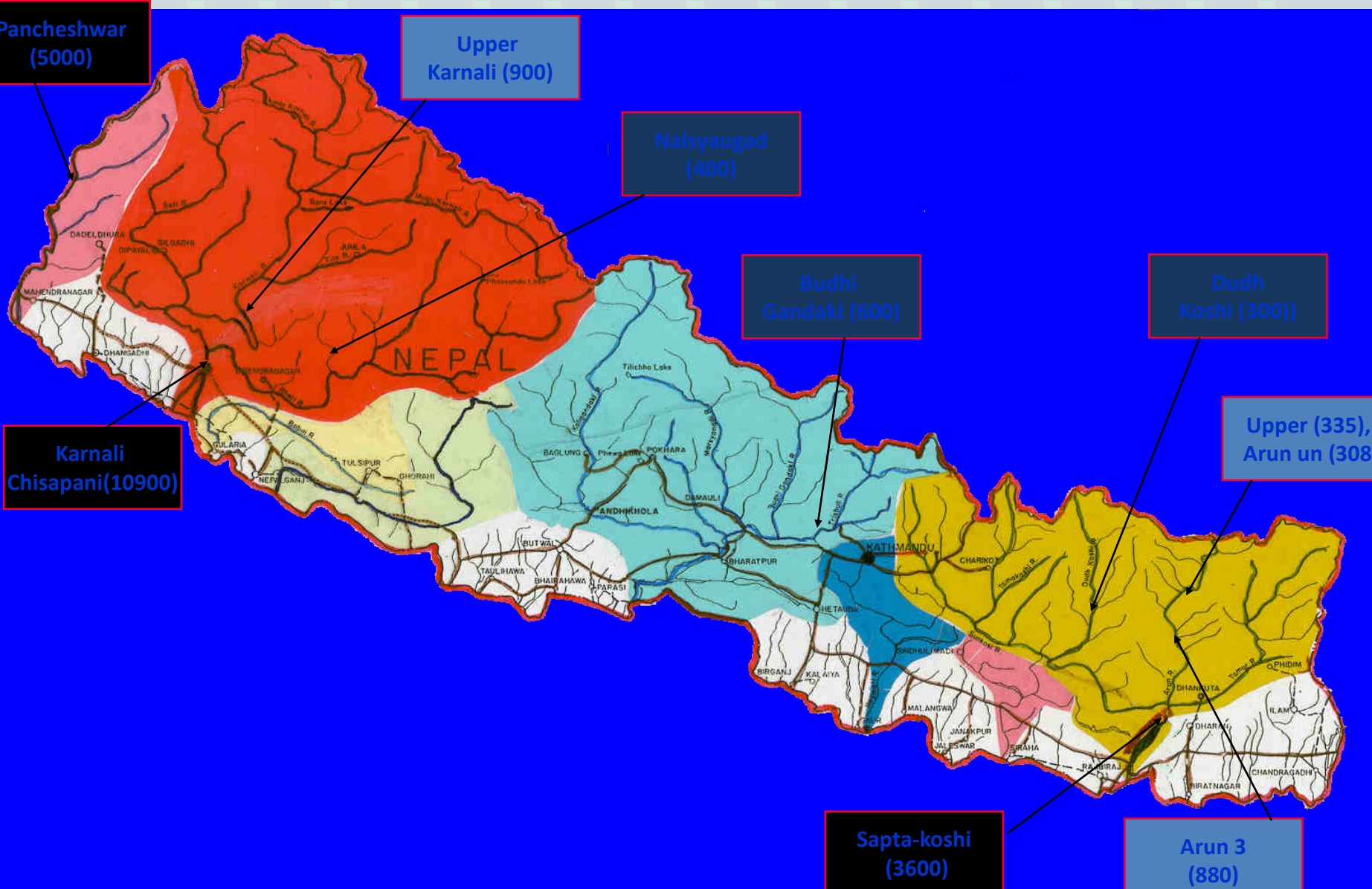
Dudh
Koshi (300)

Upper (335),
Arun un (308)

Karnali
Chisapani(10900)

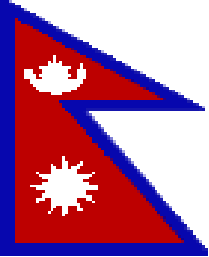
Sapta-koshi
(3600)

Arun 3
(880)

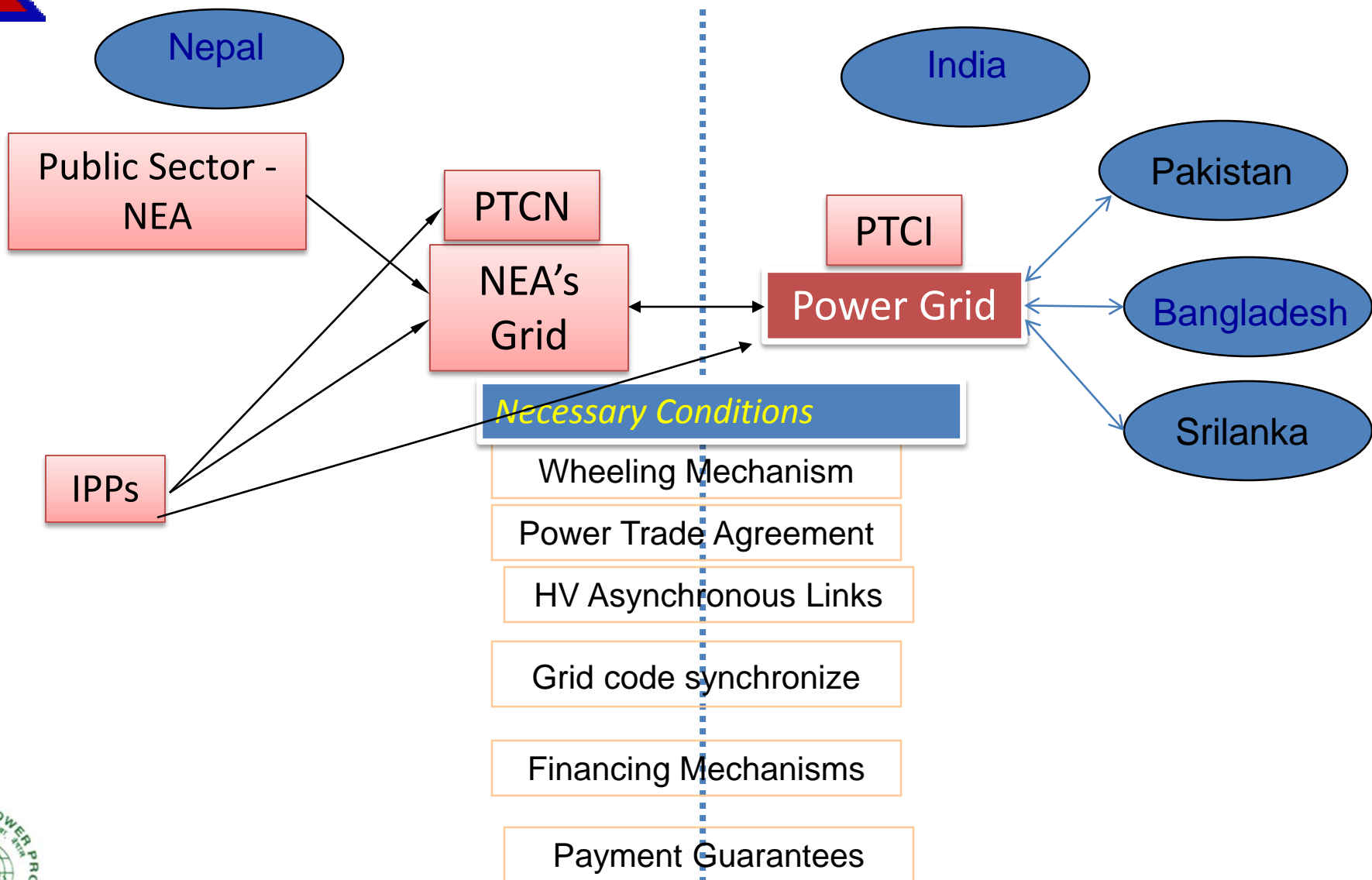




- ❑ **Lack of enough and the right type (long term and foreign currency) of funds in the domestic market, requires FDI and concessionary financial assistance.**
- ❑ **Challenge of capacity in NEA for successful project execution- Chameliya is one example**
- ❑ **Domestic and International investors perceive risks in hydropower sector. Government is attempting to lower the risk, through measures that deal with both perception and substance.**



Regional Interconnection Concept



Issues



	Issues	action
1	Security situation	Govt will mobilize all required security arrangement. All party understanding to keep hydro projects a trouble free place
2	Transitional political regime	High level political commitment for development of hydropower which has been maintained through several changes in parties and prime ministers leading the Government.
3	Perception of high political risk	No nationalization of the project

Issues



	Issues	action
4	Demand and aspirations of local people; ownership, employment, adequate compensation	Provision to make sense of ownership Peoples participation in project- investment of the local people in the project , Electrification in the periphery
5	Market assurances	PPA tariff revised NEA institutional and financial reform underway to ensure off taker viability. Regulatory framework to be introduced.

Issues



	Issues	action
6	Liquidity crunch	Policy intervention in capital formation. Hydro investment company.
7	Consistent investment friendly policy	VAT exemption in import, Corporate tax holiday for and other financial facility to be provided.
8	Forest / Environment Clearances	High level facilitation committee. Taking into consideration to preserves forest for the future generation.

Issues



	Issues	action
9	Difficulty in Acquisition of land	Effective Govt facilitation mechanism Right of way issue for Transmission line. Policy is in drafting stage.
10	PPA in Foreign Currency	NEA signed PPA in foreign currency but debate is going on whether or not to sign the PPA in FC. GON & NEA is working to find best approach consulting all the stakeholder.
11	Effective and Independent regulatory body	Provision for establishment of NERC by new enactment

Issues



	Issues	Action
12	Guarantee	appropriate mechanism under consideration
13	Lack of comprehensive Resettlement & Rehabilitation policy	formulation of required policy is underway.
14	PDA negotiation process; uncertain terms	Negotiation is in the process and Govt. prepared the model PDA . It may finalized when the issues will resolved in win-win situation.

Nepal's Expectation



- Signed the PDA and PPA with UT1 as soon as possible.
- That may assure more FDI in the Hydropower Sector Foreign Investors including Republic of Korea.
- Co-operation with Republic of Korea is in the Technology Transfer.
- Need more assistance in the technical knowledge and skill.

Further details

www.moen.gov.np

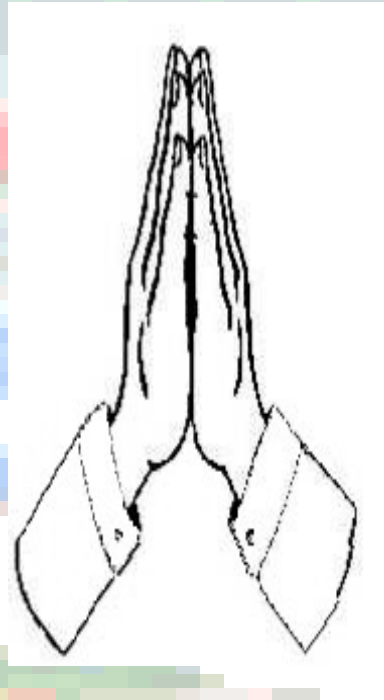
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Contact info

udayasapkota@gmail.com

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Be Positive

THANK YOU & NAMASTE