



REGIONAL DIALOGUE ON TECHNOLOGY FACILITATION FOR SUSTAINABLE DEVELOPMENT 18 MAY 2014, PATTAYA, THAILAND

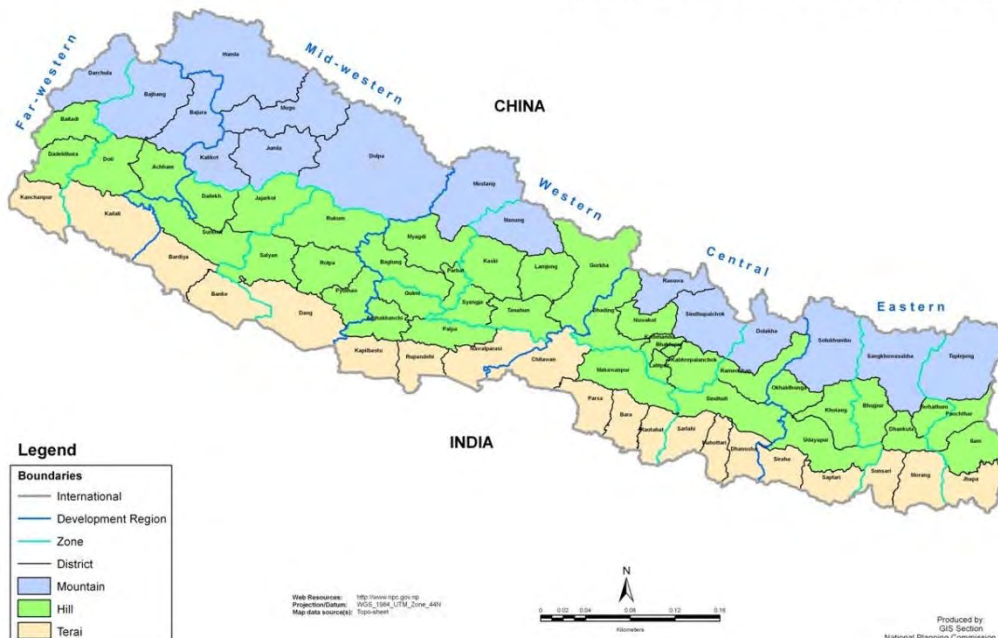
**Technology gaps and needs, and enabling
conditions for technology facilitation**

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NEPAL AT A GLANCE



Nepal: Administrative and Eco-Development Regions



- Total population: 27.2 million
- Population (annual average growth rate): 2%
- Population below int' income poverty line (ppp US\$ 1.25 days): 25%
- Human Development Index (HD) 2012 (rank/186 countries): 157
- GDP per capita at current price, 2013 (US\$): 717
- Sectoral Contribution to GDP (%) in 2013:
 - Agriculture: 34.7
 - Industry: 15.0
 - Services: 50.3
- Total education sector expenditure as a % GDP: below 4%

ALTERNATIVE ENERGY PROMOTION CENTRE (AEPC)



- National Executing Agency for Renewable energy (RE) Technologies promotion under Ministry of Science, Technology and Environment
- Major RETs in implementation:
 - Micro and Mini Hydro (up to 1 MW) including Improved Water Mills
 - Solar PV and Solar Thermal
 - Biogas
 - Biomass (bio-briquettes, ICS, gasifiers)
 - Wind, Bio-fuel (Early stage)

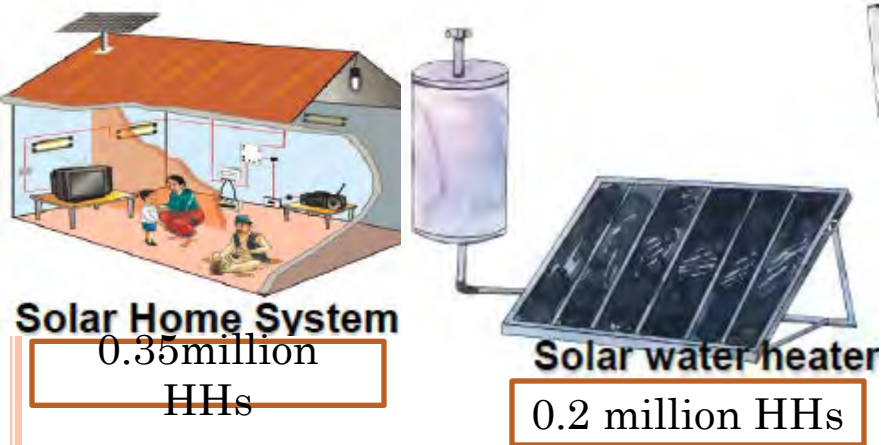
CONTRIBUTION OF RETs IN NEPAL: ABOUT 1.5 MILLION HHs ARE BENEFITTED & 14% OF ELECTRICITY SUPPLY FROM MICRO SCALE RETs



Domestic Biogas: 0.3 million HHs



Improved Cooking Stove 0.7 million HHs

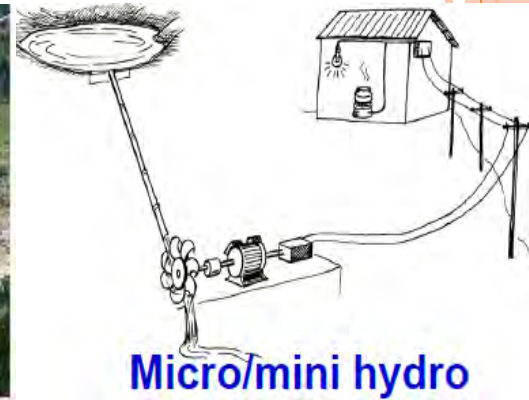


Solar Home System
0.35million HHs

Solar water heater
0.2 million HHs



0.2 million HHs



Micro/mini hydro

HISTORY OF SCIENCE & TECHNOLOGY IN NEPAL

- Introduction of Intermediate science education in 1919
- Bachelor of Science in, 1948
- Master of Science in, 1965
- Institutes of Medicine, Engineering, Forestry, Agriculture, Tribhuvan University, 1973
- The applied sciences like biotechnology, biochemistry, generics, microbiology, environmental science etc. were started after 1990's.
- The Sixth Five Year Plan (1980-1985) link S/T activities with economic development
- Centre for Applied Science and Technology (RECAST), 1977
- Royal Nepal Academy of Science and Technology (RONAST), 1982
- Ministry of Science and Technology, 1995



SCIENCE AND TECHNOLOGY RESEARCH INSTITUTIONS

- Nepal Academy of Science and Technology (NAST),
- National Forensic Laboratory,
- Natural Product Development Division (NPDD),
- Natural History Museum,
- Department of Geology and Mines,
- Department of Science and Technology,
- Nepal Agricultural Research Council (NARC),
- National Bureau of Standard and Quality Control,
- Nepal Drugs Research Laboratory,
- Research Centre for Applied Science and Technology (RECAST),
- National Institute of Health Sciences,
- Central Food Research Laboratory,
- Department of Hydrology and Meteorology,
- Department of Forest Research and- Survey,
- Centre for Environmental and Agricultural Policy Research,
- National Centre for Information Technology
- Universities



Science and Technology: Indigenous Technologies

- Crafting: religious artifacts, images and statues of bronze, copper or gold found in the temples.
- Architecture and civil engineering: often blended with art and culture mostly temples, pagodas and stupas.
- Textile manufacture using spinning and weaving devices such as handlooms.
- Traditional method of paper manufacture.
- Food technology: brewing beers, wine and hard liquor, preserving meats, fruits and vegetables.
- Modern science and technology institutions began after 1951. Until then relied almost entirely upon its indigenous technology for development.



Science and Technology in Nepal


- National Science and Technology Council: Chaired by the Minister of Science, Technology & Environment
 - To review and revise the policy.
 - To find out measures for resolving the problems.
 - To review the progress.
- Nepal Academy of Science and Technology, 1982
 - Advancement of S & T for development of the nation.
 - Preservation and modernisation of indigenous technologies.
 - Promotion of research in S & T
 - Identification and facilitation transfer of appropriate technology

Science and Technology Policy 2005


Vision

- To build developed, dynamic and prosperous state by raising the living standards through the appropriate development and use of science and technology.

Objectives

- Enhance national capacity through the appropriate development and use of knowledge, skill and efficiency in the field of S & T.
 - Contribute on poverty reduction activities by utilizing natural means and resources through the use of science and technology.
 - To elevate the country to a competitive position through the optimum development of science and technology.
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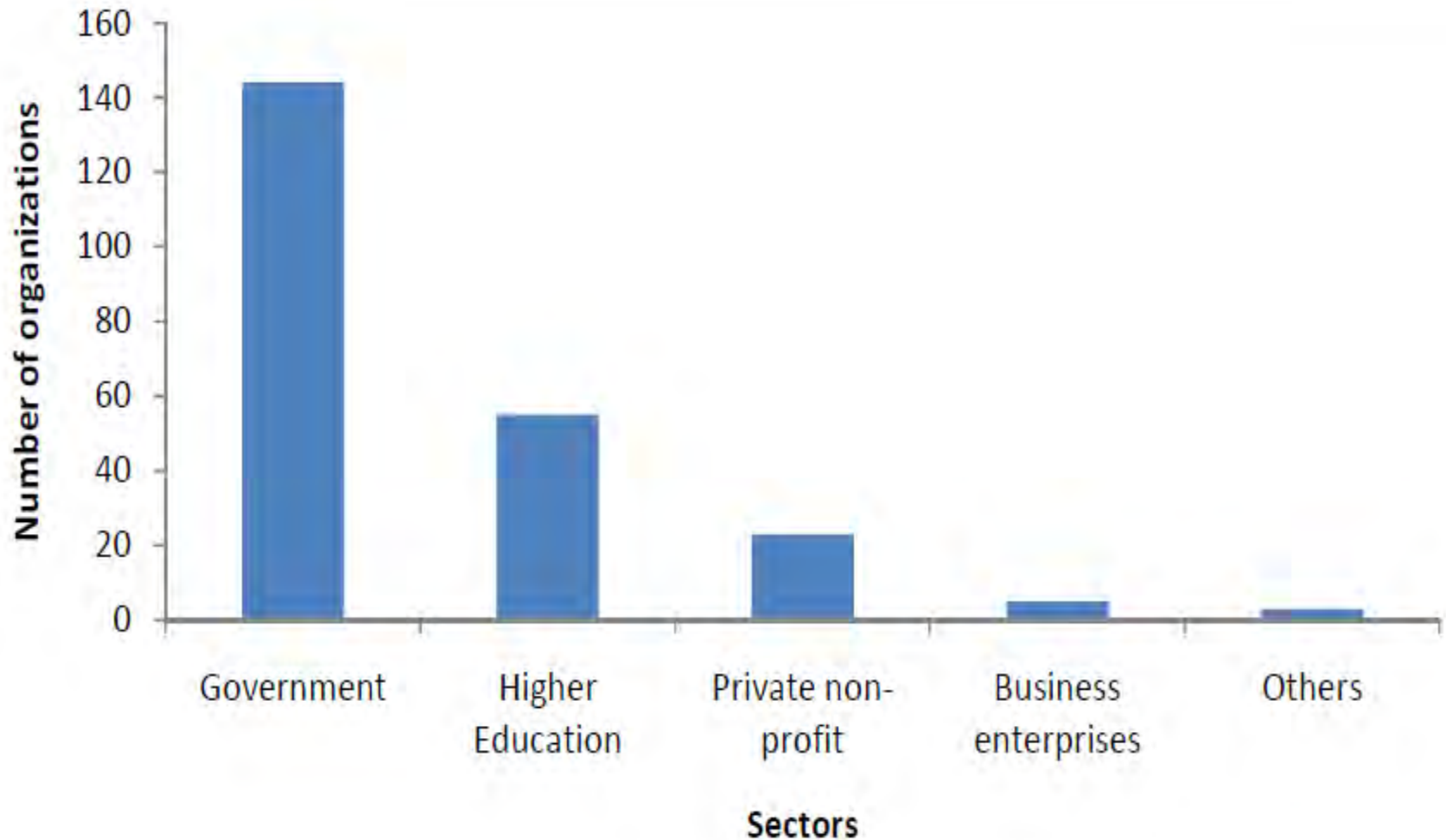
SCIENCE AND TECHNOLOGY POLICY 2005

- **Industrial Technology:** A minimum of 30% contribution of industrial sector in the national budget is considered as a financial requirement for a developing country.
 - **Maintenance Technology:** Maintenance technology is secondary technology and thus deals with implementation and application of industrial technology in ecofriendly environment.
 - **Advance Technology:** Some of the major sectors of national interest in advance technology are genetic engineering, biotechnology, information technology, electronic technology, air craft technology, national defence technology, alternative energy technology, nuclear power technology, anotechnology, health science technologies, satellite technologies, etc.
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PRODUCTION OF HR IN S & T IN NEPAL (CUMULATIVE NUMBER)

SN	Subject	1985*	2005*	2008	2010
1	Engineering	2389	11234	15801	20693
2	Natural Sciences (Botany, Zoology, Physics, Chemistry, Mathematics, Statistics, Geology, Meteorology, Env.Sc., Microbiology, Computer Sc)	1909	7347	8819	10022
3	Medical Science	1658	5496	5732	7769
4	Agriculture	1396	3004	3334	3616
5	Forestry	719	798	919	925
6	Food Technology	165	224	275	332
7	Pharmacy	-	-	-	687
Total Number		8,236	28,103	34,880	44,044

SECTOR WISE CLASSIFICATION OF S & T INSTITUTIONS



BUDGET COMMITMENT IN S & T SECTOR

- The budget allocation in education by the Government of Nepal is 16.5% of total national budget.
- Only 10% of this budget goes to higher education and S & T education gets 1.2% of this budget fraction.
- The expenditure in scientific research and development activities is only 0.3% of GNP,
- Research and scientific institutions are not prioritised in the allocation of resources, and that government and academic agencies do not have the up-to-date equipment they need to face emerging issues



GOVERNMENT PLAN IN S & T

- Realized the importance of S & T in sustainable development and poverty reduction
- Some of the key areas planning to consider:
 - Improving Science and Technology education in schools and universities, by increasing students enrollment in science, mathematics and engineering;
 - Increasing investment in science, technology and innovation;
 - Developing strategic partnerships between public and private, and technology sectors at national and regional levels;
 - Establishing long-term monitoring systems for scientific, socioeconomic enhancement;
 - Blending scientific knowledge for sustainable development



GOVERNMENT PLAN IN S & T

- Realized to make functional existing S & T institutions with updating their infrastructure and capability, and to explore new and emerging scientific and technological areas and establish new centers for research
- Plan to set up four technology centers
 1. National Nuclear Technology Center
 2. National Bio-Technology Center
 3. National Space Technology Center
 4. National Nanotechnology Center
- Formulated the Biotechnology policy in 2006 aiming to use modern biotechnology for the economic development, especially to promote research and development in agriculture, health, environment and industry



GOVERNMENT PLAN IN S & T

- Formulated the National Nuclear Policy in 2007 for economic and social prosperity of the nation
- Space technology centre for
 - Satellite communication, Telecommunications, Television broadcasting, Disaster monitoring, Remote sensing, Geographical Information System & Global Positioning System Environmental surveying, Weather studies (forecasting) & hydrological studies, Metrological utilization
- Enhance access of students from all classes, communities and regions to science education
- Soft credit for higher studies in medicine, engineering, agriculture, and science and technology



NEW INITIATIVES TOWARDS CLIMATE FRIENDLY TECHNOLOGY

- Technical Need Assessment (climate friendly) ongoing
- Implementation of Local Adaptation Plan for Action ongoing
- Formulation of Low Carbon Economic Development Strategy ongoing
 - Coordinated by National Planning Commission
 - Led by Ministry of Science and Environment
 - Managed by Alternative Energy Promotion Centre
- National plan is directing towards green path




Some Issues

- Poor public understanding of Science and Technology.
- Lack of coordination and cooperation between science and technology organisations
- Less priority for R&D and state funding in S&T very low.
- Lack of integrated long term master plan for the development of science and technology
- Gaps between policies and practices and between planning and performances
- Technology development and transfer not institutionalised.
- Lack of economic development: No funding in R&D from the industrial and private sectors.
- Lack of minimum research facilities: Brain drain.



SOME QUESTIONS

- What should be minimum budget allocation for S & T
 - Why are our institutions not working in the manner they should ?
 - What should be the institutional mechanism to implement S & T policy effectively?
 - What quality of science we have in our lab?
 - Why can not we translate whatever R/D we have done into commercial products?
 - What roles are expected from scientists, science teachers, policy makers, law makers and decision makers?
 - What should be the S & T policy for collaborating with international community
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EXPECTATION FROM INTERNATIONAL COMMUNITY

- Capacity building
 - higher education in S & T
 - R & D
- Financial support
 - for establishing research lab
 - research in prioritized areas
 - Identification & development of appropriate technologies
 - To move towards green development path
- Technology transfer but not exporting technologies in national prioritized areas
- Establish collaboration with Nepali academic & research institutions
- More importantly technical development and transfer
 - Adaptation technology
 - Low carbon technology

