

10th APEC-Tsukuba International Conference

Innovation of Mathematics Education Through Lesson Study.

Challenges on Energy Efficiency on STEM and Cross-boarder Education.

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Papua New Guinea Presentations on;

- ❖ **Major Issues on Energy in Papua New Guinea**
- ❖ **Reforms in PNG in relation to STEM**
- ❖ **Possible Lessons Studies for Cross Boarder**

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MAP OF Papua New Guinea



Introduction

Papua New Guinea

PNG occupies the Eastern half of the Island of New Guinea, just North of Australia, many outlying islands. The Indonesian province of West Papua (Irian Jaya) to the West.

- *Consist of 4 regions, 22 Provinces & 89 districts*
- *800 + Languages & varying Cultures*
- *English Official Language in schools & business*
- *Land area: 452,860 sq km*
- *Population: (2014 est.) 6,552,730*
- *Capital City: Port Moresby*

Introduction

- *Government: Constitutional Monarchy*
- *Current Prime Minister: Peter O'Neil*
- *Sovereign: Queen Elizabeth II*
- *Governor General: Sir Michael Ogio*
- *1 Governor per provinces & a National member/district*
- *Monetary Unit: Kina, (PGK)*

Major Issues on Energy

Energy consumption

- *0.5 toe/capita,*

Non-renewable Energy

- *Fossil Fuel , (49%)*

Renewable Energy

- *Hydro +Geothermal (10%)*
- *Biomass (39%), (pngbiomas.com)*
- *Gas, (2%)*
- *Solar Energy*
- *Wind Power*

PNG Energy Demand & Supply Outlook (Summary)

- *Papua New Guinea will become a major LNG exporter with the start-up of LNG export projects after 2014.*
- *□ Papua New Guinea's total primary energy supply is projected to increase from 2.2 Mtoe in 2010 to 6.7 Mtoe in 2035; fuel gas for LNG liquefaction accounts for a significant portion of this increase.*
- *□ Papua New Guinea may shift from a net oil exporter to a net oil importer after 2020 unless new reserves of oil are found.*
- *□ Papua New Guinea has a significant hydroelectric and geothermal potential. The government plans to either build or upgrade 800 MW of hydro electricity and over 500 MW of geothermal generating capacity within the next 10–15 years to provide a reliable and affordable electricity supply*

Major Issues on Energy

Renewable Energy

- Land
- Money

Non-Renewable

- Money

Inefficiency

- PNG Power

*PNG Electricity Consumption is 3.116 billion kWh,
(2010 est.) (indexmundi.com)*

Reforms in PNG in relation to STEM

- *PNG Curriculum Reform*
 - *Standard Based Curriculum, will capture STEM Contents and concepts*
 - *Primary & Secondary School Level*

Reforms in PNG in relation to STEM

- *Curriculum Framework* to capture STEM
- *Content* on STEM
- *Practical lessons*
- *Teachers preparations*
- *Create awareness*

Key Learning Area	Elementary	Lower Primary	Upper Primary	Lower Scondary	Upper Secondary
Mathematics	Mathematics	Mathematics	Mathematics	Mathematics	Mathematics Extension Maths A Maths Core (Maths B) Life Maths
Science & Technology	Science	Science	Science	Science Environmental studies Applied Science	Science Biology Chemistry Physics
Engineering			To be captured at the Tertiary Institutions & TVET Education		

Possible Lessons Studies for Cross Border

- PNG has 4 regions, 22 provinces 89 districts and 800+ Languages and similar Cultures
- Lesson studies will be administered within the country by using mobile phones & visitations, ICT
 - Provinces, eg. Two or more schools in several provinces share ideas and lesson plans on STEM with each other, Highlands Region & Islands/Coastal region
 - Several Teacher training institutions linked to each other through internet and sharing ideas on STEM and impart on trainee teachers and students through practical teaching

Possible Lessons Studies for Cross Border

- *FODE (Flexible & Open Distance Education) established across the 22 provinces & even in the districts are good avenues to start STEM.*
- *A success story on “SMS Story” using mobile phone SMS trailed in Madang & Simbu province in PNG is a good example, (mobile story Research Project, (Papua New Guinea / www.frontlinesms.com) (SMS Story: impact Assessment Report 2013/VSO www.vsointernational.org)*

Possible Lessons Studies for Cross Border

- PNG already have networking with its regional neighbors, the Pacific countries,
- For example; Pacific Islands Literacy and Numeracy Assessment, (PILNA); Pacific Benchmarking for Education Results, (PaBER) (www.eqap.org.fj) & Early Grade Reading Assessment, (EGRA), Early Grade Mathematics Assessment, (EGMA)
- JICA funded EQUITY Project
- These networks can ENHANCE Cross Border Lesson Study with APEC Economies.

Conclusions

- *Capture the Energy STEM content in the reformed Curriculum*
- *Identify the Key Learning Area for STEM,*
- *Identify the Knowledge, Skills, Attitudes + Values*
- *Identify the content standards statements*
- *Plan STEM Activities,*
- *Identify supporting resources*
- *Create awareness*

Our first task is to do policy submission to DoE and seek Board of Studies Approval.

EM TASOL...TANKIU BADA HEREA