Education and Skills for Inclusive Growth and Green Jobs in Asia: TVET perspective

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Manila, 10 December 2014

Ten points

source
Develop
pay
quality
little
Inadequate
effective
job
resources
institutions
competition
example
Applying
attention
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jobs
funding
Training
problem
inclusive
programs
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just
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limited
teaching
society
employers
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mechanism
Poor
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young
textbook
public
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human
high
green
bodies
Awareness
need
content
learners
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units
result
big
theory
ways
solve
enterprises
management
gap
social
subjects
development
Change
requirements
Many
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sectors
Changing
strong
economy
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access
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downturn
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Low
well
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effectiveness
Lack
difficult
energy
economic
vocational
necessary
particular
change
enterprise
income
regulations
teachers
responsibility
protection
practice
education
labour
meet
Forecasting
demand
pollute
private
Teachers
Limitation

Government do not consider greening as a part of TVET Reform, only isolated efforts are observed

- MOET (Viet Nam) – 30hrs course on climate change (together with EU) one - for agriculture, one - for industry. Compulsory for technical secondary schools.
- TVEC (Sri Lanka) – 'Basic Competencies to work' NCS (to award NVQ Level 1) include environmental issues and waste minimization

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Governments do not have a systematic approach for the inclusion of TVET as an important strategy for Greening Economies

Differences between green sectors and greening of all sectors in terms of skill gaps and implication

Green skills	Current gaps	Purpose	Future gaps
All occupations (e.g. hospitality, apparel, transport, construction)	Nominal	'TVET for life' Attitudes and future work opportunities	Potentially significant due to governments' initiatives such as the National action Plan for Haritha Lanka Program (Sri Lanka) (National Council for Sustainable Development, 2009), The Viet Nam Sustainable Development Strategy for 2011-2020 (Viet Nam Government, 2012), The Viet Nam National Green Growth Strategy (Viet Nam Government, 2012)
Green occupations (e.g. clean energy, green transport)	Is recognized	'TVET for work"	Visible

Broader orientation for TVET

TVET for Life and Work

(not just 'responding to the labour market needs')

- To increase the scope of greening TVET
- Job opportunities due to entrepreneurial activities
- High percentage of small and medium enterprise – difficult to formulate needs
- Different roles of TVET, including training in response to community needs

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Models for greening TVET

Model 1

- A decentralised private model led by PPP/ private training providers and industry with government funding and policy direction (e.g. NSDC, India).
- Certain risks associated with this model include incomplete coverage, variable quality, and variety of green skills interpretation.

Model 2

- A formal public model led by the government through explicit green skills programs. This model requires a long-term strategy for planning and implementation
- Certain risks associated with this model include time required to develop and implement change and being driven by bureaucracy it might partly ignore industry requirements.

Obsession with frameworks? Dilemmas to address for Greening TVET

Four types of dilemmas that educators face during implementation of an educational reform:

- **Conceptual dilemmas** (understanding of the underpinnings of greening of TVET)
- **Pedagogical dilemmas** (arising from the more complex approaches to designing curriculum, different learning experiences)
- **Cultural dilemmas** (roles and expectations of teachers, students, community)
- **Political dilemmas** (resistance from various stakeholders) (adapted from Windschitl, 2002)

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TVET institutions- based initiatives can be viewed as an immediate solution

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SMK 27

Academi Technik Mesin Industru (ATMI)

"Buildings are responsible for more external pollution than any other product" (Mackenzie, 1997, 38)


PHỐI CẢNH TỔNG THỂ
TRƯỜNG CĐN TRẦN HƯNG ĐẠO

Interesting models generated by VTPs

- Production of green products for skills development
- Establishment of companies by several VTPs
- Start-up companies for greening

Balai Latihan Pendidikan Teknik *(BLPT)* Yogyakarta

ATMI

ATMI Kreasi Energi

smart energy for better living

SunPulse Water

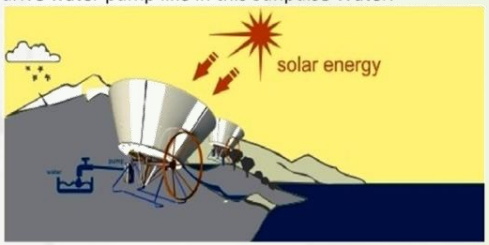
Solar Water Pump

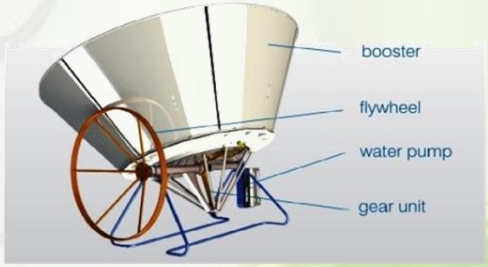
The SunPulse Water is a world-leading low-temperature Stirling engine water pump for decentralized water supply and distribution. It is particularly simple to construct and can therefore be produced locally.

Concept

The SunPulse Water can pump water from various depths according to the water pump which has been installed with the engine. The effectiveness of the engine can be increased with additional water tank. The machine is working when the sun is shining and the distribution of the water for irrigation or to the houses can be done out of the tank even when there is no sunlight.

This machine uses the sunlight to heat the air inside the engine and the pumped water to cool it again, resulting to pressure fluctuations inside the engine, which are moving a piston. The piston will turn the flywheel, then rotation of fly wheel can be used for various applications, for example to drive water pump like in this Sunpulse Water.





Application

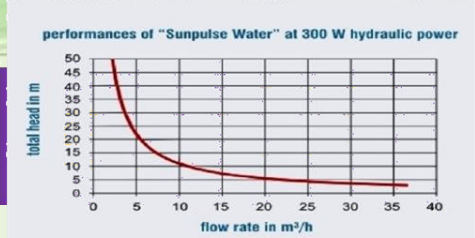
- ✓ Suitable for developing countries that the majority of the population depends on home grown agricultural products.
- ✓ Can be produced with the simple facilities available in sunbelt countries.
- ✓ Can be put into service as the prime mover in a variety of other applications, such as:
  1. Driving grain mills, power saws, presses etc.
  2. Driving air compressors to store compressed air to be used for pneumatic tools, for water oxygenation, etc.
  3. Driving a generator to produce electricity.
  4. Driving an oxygen concentrator to selectively filter oxygen from atmospheric air.

Technical details

- Dimension : 3600 x 3600 x 3400(mm)(with booster)
  2500 x 2500 x 1800(mm)(without booster)
- Total weight : 650 kg
- Manual daily tracking angle moveable
- Water cooler temperature : max 30°C
- Out rotation of machine : 30 rpm
- Depth of wells : maximum 5 meters (7 meters with special pump)
- Pumping height : maximum 10 meters (60 meters with special pump)

Advantages

- Use sun's rays as energy , so it is environmentally friendly and cost efficient solution.
- Can also be employed to provide drinking water
- SunPulse water with bellow pump can pump from storage lakes or ground water from max. 5 meters deep, and max 10 meters high, this is ensuring the irrigation of an average family business
- can pump deeper till 60 m with by coppling it to a immersed piston pump like **India Mark 2**



Greening of TVET: A holistic approach for skills development for life and work

<table>
<tr><th colspan="3">Attitude change</th></tr>
<tr><td colspan="2">Teaching and learning</td><td>Green campus & extra-curricula activities</td></tr>
<tr><td colspan="2">Content</td><td>Pedagogy</td></tr>
<tr><td>Generic skills</td><td>Specific skills</td><td>Learner-oriented including workplace learning</td><td>Links with community</td></tr>
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TVET institutions
Reasons for greening TVET

- **International training standards** used by vocational training providers (VTPs) often include environmental protection issues (e.g. for marine training International Marine Organisation standards)
- **Environmental legislation** (e.g., emission control systems)
- **Rules and regulations in industry sectors** (e.g. in training for the hospitality sector - hygiene in food preparation; security in a hotel includes environmental protection)
- **New occupations** (e.g., specialised green skills - eco-tourism is one of the subjects in a tour guide specialisation).
- **VTPs initiatives** (e.g., introduction of a hybrid engine module into curriculum; setting start-up teams to develop technologies to deal with environmental concerns)
- **Government initiatives** (e.g. universities and technical colleges are requested to identify subject areas to incorporate issues of SD; *development of* modules, subjects, and units for both specific and generic green skills initiated by the ministries that TVET providers should include in their programmes or can use when developing programmes).

Policies and action plans

- To support green growth (to formulate LM demand in greening)
- To coordinate existing policies on green growth and skills development
- PPP models as a flexible faster option
- Support and showcase VTP level initiatives
- Focus on learning practice and teacher education

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