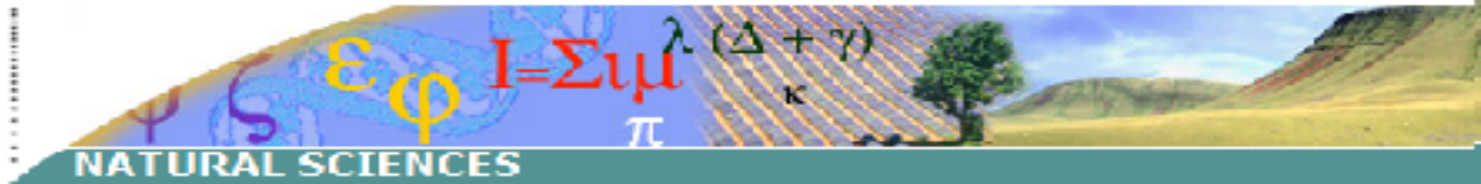


The Natural Sciences Sector  
UNESCO

# *ERII: Conceptual and Methodological Framework*

Rovani Sigamoney  
*UNESCO Engineering programme*

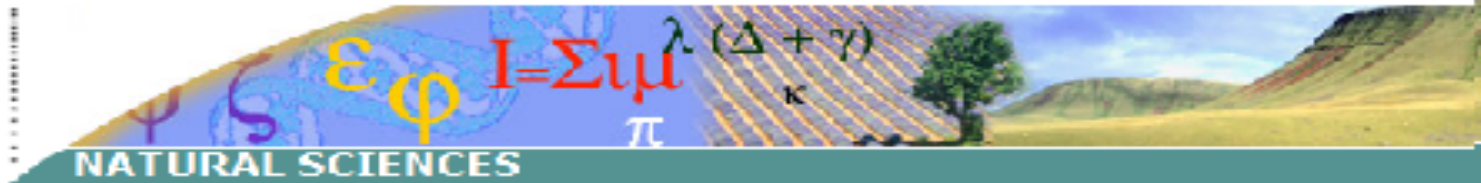
*ERII Kickoff Meeting  
26 September 2017  
Beijing, China*



# Food for thought?

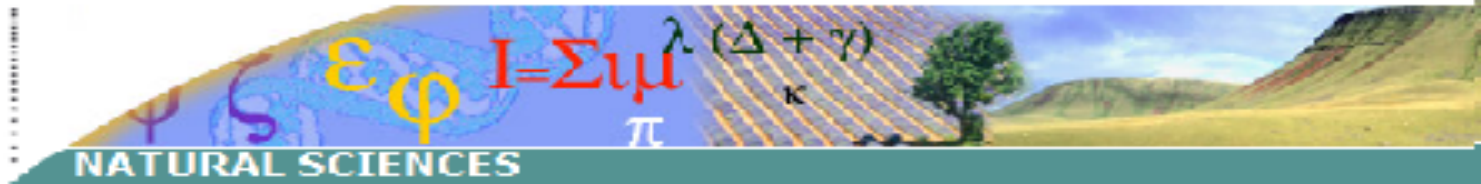
- More people have mobile phones than toilets! Six of the world's seven billion people have mobile phones - but only 4.5 billion have a toilet - UN Study
- Now more mobile phones in the whole of Africa than there are in the USA
- 2001:25 million- 2012: 650 million (increase 2600%) - The Higher Times, Sept 2013
- Internet penetration at 15.6% in Africa, +-83.6% UK, but in Somalia it is 1.2% - Internet World Statistics
- How do we encourage more youth to go into careers of Science and Engineering?
- Financial Reward: "Engineering degrees produce the most millionaires" (*Spear's* magazine and WealthInsight, 2013)
- It is estimated that some 2.5 million new engineers and technicians in sub-Saharan Africa - MDGs
- 1 engineer per 10 000 in sub-Saharan Africa
  - 1/311 in UK
  - 1/227 - Brazil





# UNESCO Engineering Report

- First engineering report by international organization
- Over 120 expert perspectives on the importance of engineering for sustainable development
- **Challenges for the engineering profession include:**
  - Attraction and retention of youth to engineering, particularly women
  - Strengthening education institutions
  - More interdisciplinary activities in engineering curricula
  - Focus on innovation, entrepreneurship, and job creation
  - Promoting increased public awareness and support for the profession

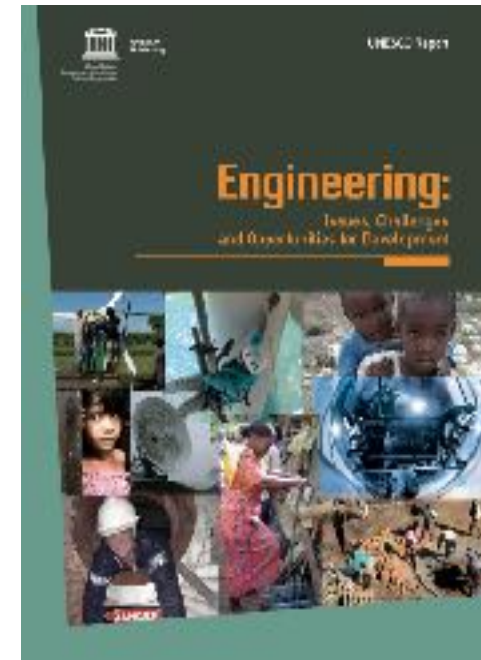


# Why the SDG's?

- All targets of the MDG's were not fulfilled.
- Over **1.1 billion people** - no access to electricity
- **2.4 billion people** - no adequate sanitation
- **663 million** - lack access to clean water
- **1/3 of world's population** - not served by adequate roads
- **150 million children** < 5 years old malnourished  
- don't survive or grow up stunted.

# UNESCO Engineering Report 2

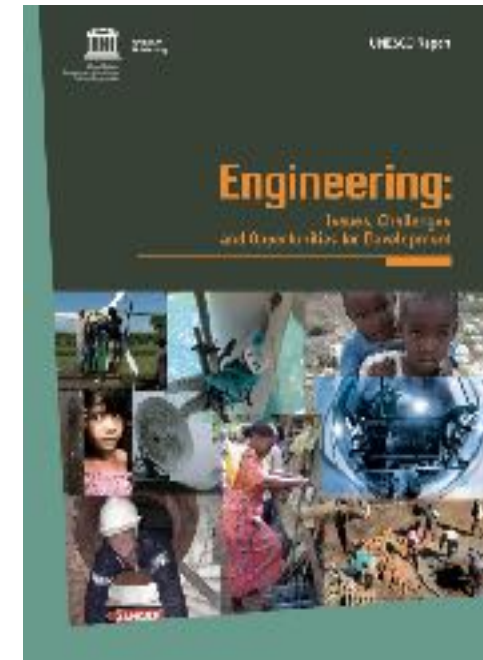
- UNESCO Report: Global Engineering Assessment
- Examine tertiary-level enrolment, graduation and professional employment in engineering disciplines
- UNESCO Global Priorities: Gender Equality and Africa
  - Data disaggregated by gender and engineering discipline
  - Intensified data collection efforts in Africa where reporting is typically sparse
- 3-5 Case studies per UNESCO region
  - Africa
  - Arab States
  - Asia and the Pacific
  - Europe and North America
  - Latin America and the Caribbean
- Case studies present policy recommendations given the engineering capacity and competence



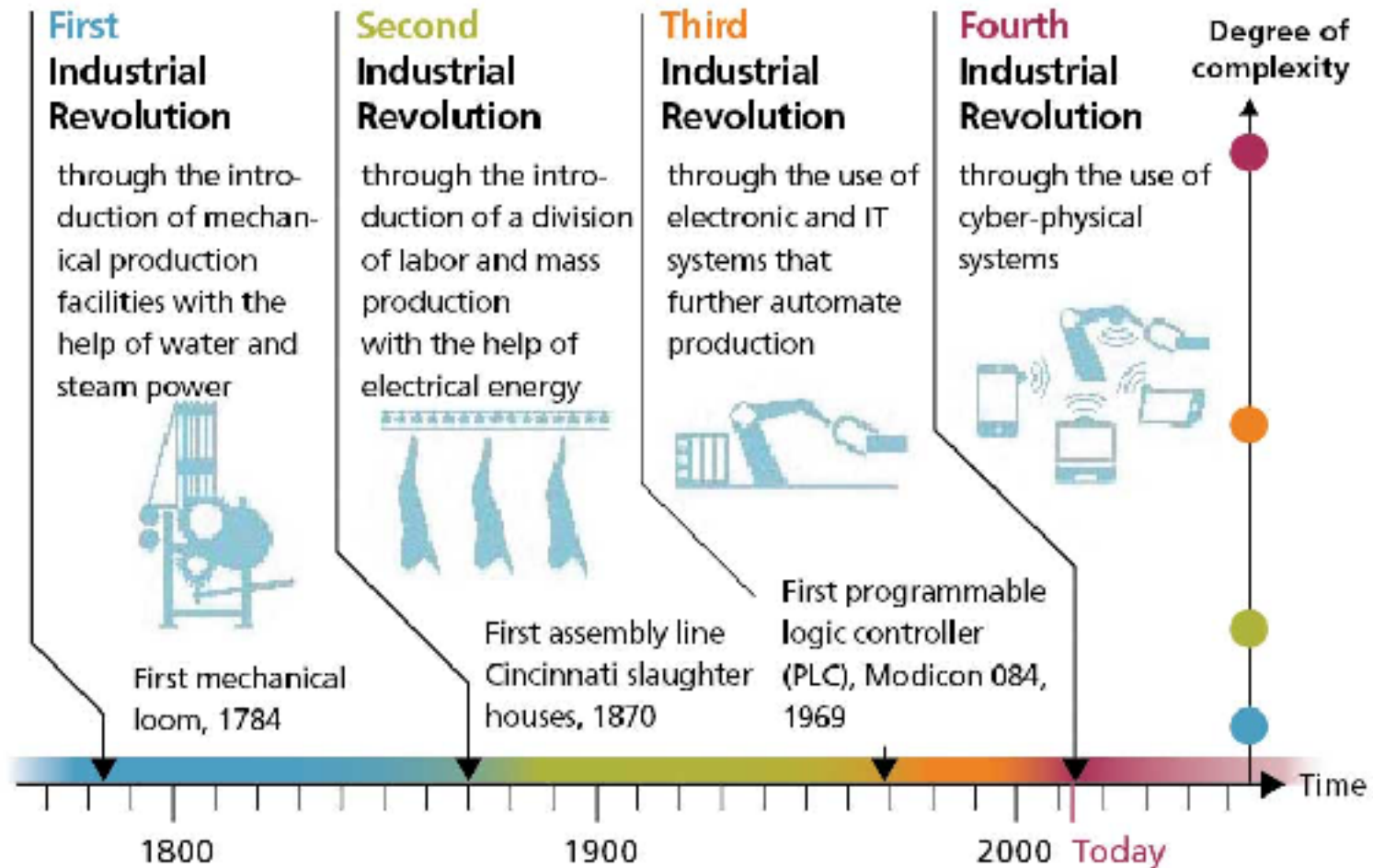


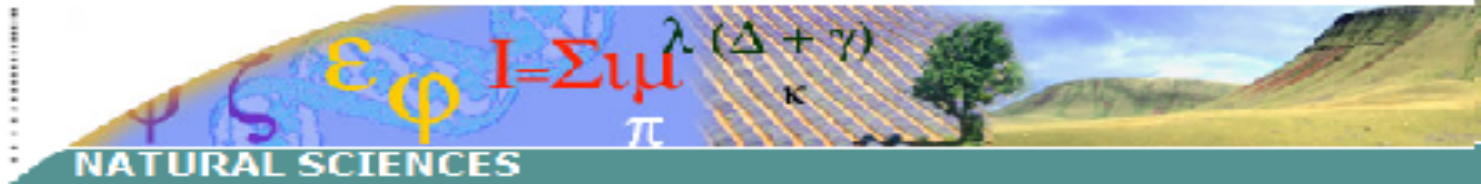
# Global Engineering Assessment

- Data support from:
  - UNESCO Institute of Statistics (UIS)
  - International Labour Organisation (ILO)
  - World Federation of Engineering Organisations (WFEO)
- Need to establish data series to detect trends
- Data comparisons to assess capacity-building policy impacts and inform future policy actions
- Need to develop conceptual framework to ensure sustainable, consistent methods over several report cycles



# The Industrial Revolution & future Jobs





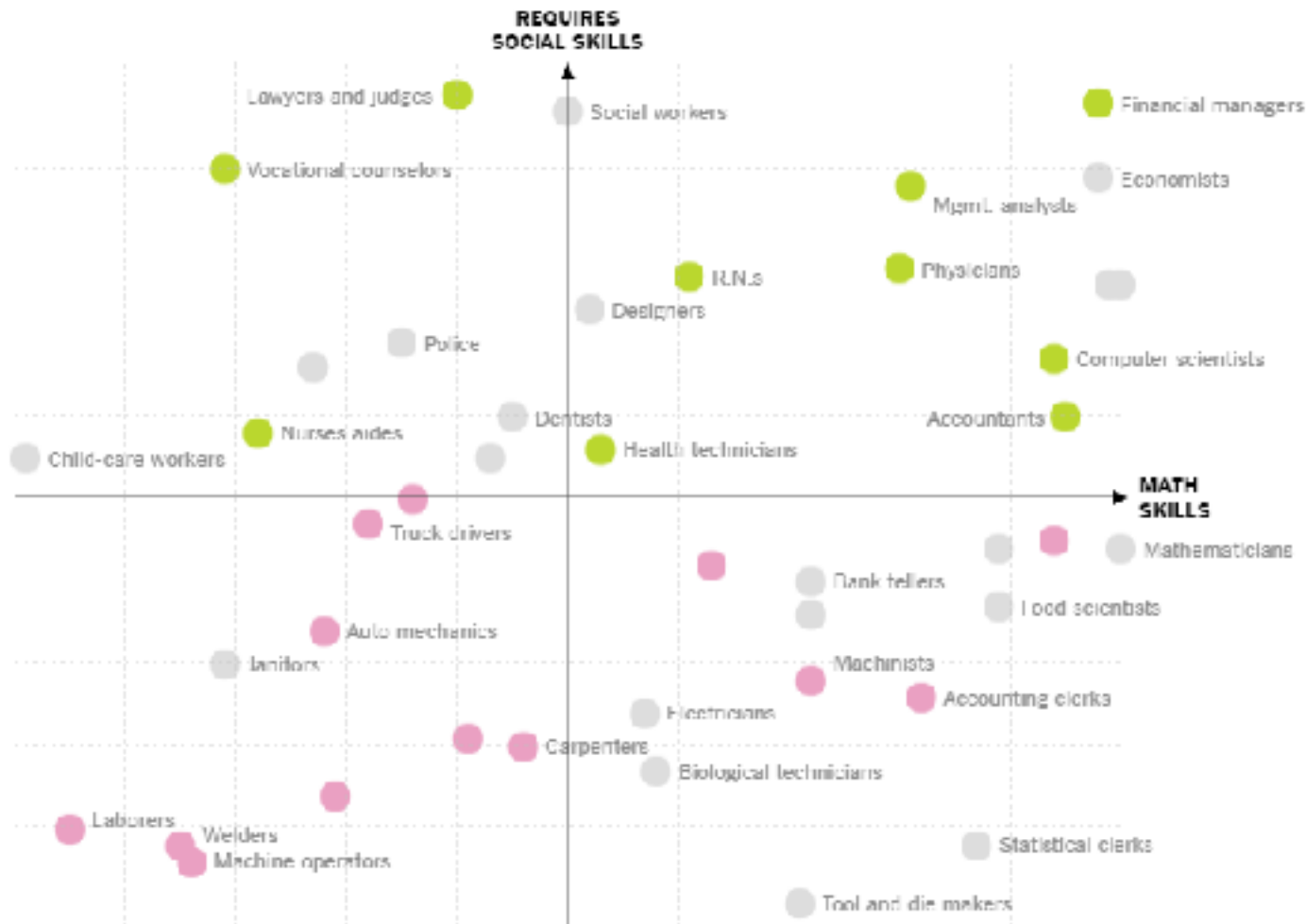
# Conceptual Framework

- What type of data are we hoping to collect?
  - UIS data
  - Big Data - UN Data Innovation Lab
  - Current Jobs and Employment - ILO, governments, industries
  - Professional engineers/type of Employment - LinkedIn
  - Future careers in Innovation and Technology - AI, tech-savvy
    - What are the future jobs and future skills needed for the 4th Industrial Revolution?



# Conceptual Framework

KEY: Change in share of jobs, 1980 to 2012    ● Fell    ● About the same    ● Grew



# Conceptual Framework

## Employment outlook across job families jobs change in thousands, 2015-2020



Across major economies - see report for full list.

Source: Future of Jobs Report, World Economic Forum

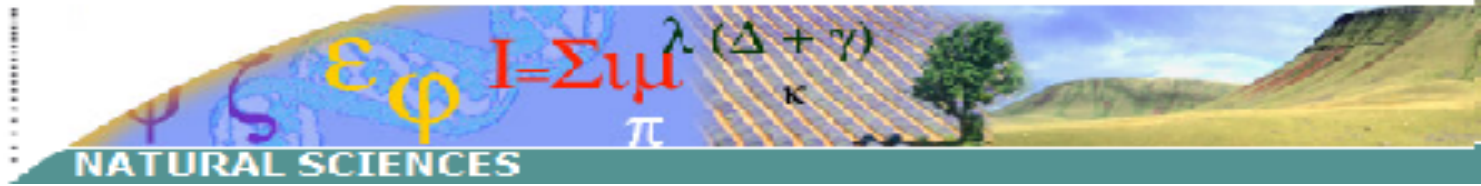
# Conceptual Framework

## Employment outlook across job families jobs change in thousands, 2015-2020



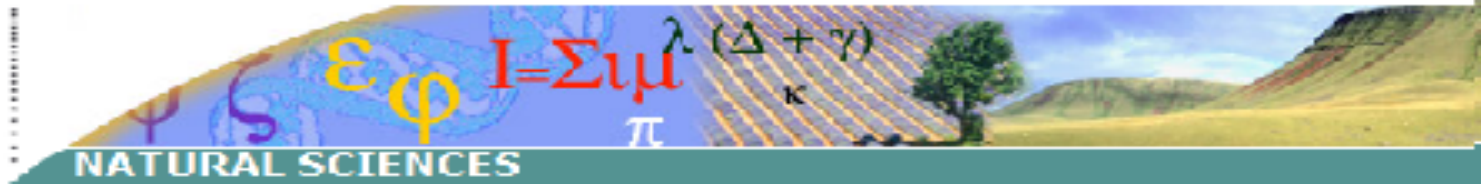
Across major economies - see report for full list.

Source: Future of Jobs Report, World Economic Forum



# Conceptual Framework

- How do we collect this data?
  - Surveys
  - Interviews
  - Big data mining
  - National Professional organisations/bodies
- Toolkit for Countries
- Implementation and roll out in next ERIII?
- Working with UIS - statistician/data resource person



# Institutional Capacity-building

## EACE Transformation Initiative: Concept Note

### Background

The concept below... developed by EACE in a workshop with ICE, VSO, RAEng, UNESCO, WFEO. The workshop was hosted by ICE in London and EACE participation was supported by UNESCO.

### Vision / Purpose

- ï Development of a strong national institution which can contribute to...
- ï To improve the standard of Ethiopian civil engineers
- ï Working to international standards
- ï To complement existing initiatives on university engineering education taking place in Ethiopia
- ï Accelerating development of Ethiopia
- ï Increasing local content in engineering projects delivered by international firms in Ethiopia