

Energy Access and Poverty Dynamics: Research Brief

November 22, 2014

Energy access, and eradicating extreme poverty and hunger are foremost development agenda of our time and expected to continue hold their places on post-2015 development agenda as well.

Our methodology to the research question follows Q² –approach (qualitative and quantitative). This particular research builds on seminal work of Irvine Fisher (1892) and incorporates knowledge from the most profound discoveries of 20th century – quantum mechanics, relativity theory, capability framework etc. – to name just a few. The quantitative approach utilizes the Laws of Thermodynamics to complement qualitative approaches by many pioneers in this field. This is a work in progress, however in this brief we present the following updates as of October 31, 2014:

- a) Identified generalized equation of interactions between a society and an individual;
- b) Discovered science based definition of absolute poverty, analytical reasoning behind poverty ladder and vicious circle of poverty;
- c) Identified temperature and entropy equivalent properties of an economic system – S/r , and dSI/S respectively, where S and I are vectors representing societal and individual strength, r is trust vector.
- d) Developed the First Law of Thermodynamics based analogy to explain economic 'boom and boost'. Alternatively, updated the Harrod-Domar (HD) model of economic growth based on foundation of thermodynamics.
- e) Defined mathematically an equation for 'capabilities' perceived by Sen borrowing analogy from a vector field; and
- f) Enhanced conceptual framework to support design of energy access program utilizing the Capability Approach, and the HD model.

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About e4CDp:

Energy for Capabilities Development (e4CDp) is a spin-off registered in Massachusetts based on R&D effort at Center for Energy Efficiency and Renewable Energy, University of Massachusetts. Advised by Prof. Jon G. McGowan, e4CDp strive for developing Navier-Stokes-Equations¹ class of formulations on issues of social dynamics, solving them and disseminate insights to the decision-makers and other stakeholders for wider public commonwealth. A partnership of scholars from four renowned universities, its effort is coordinated by Ram Poudel, a PhD student at UMass currently in sabbatical from Institute of Engineering, Tribhuvan University.

For more information on e4CDp, please visit www.e4cdp.org or follow us on Twitter @e4CDp.

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¹ <http://www.grc.nasa.gov/WWW/K-12/airplane/nseqs.html>