



NETWORK KNOWLEDGE FOR THE 21ST CENTURY

RADMILO PESIC

UNIVERSITY OF BELGRADE, FACULTY OF AGRICULTURE

WORLD ACADEMY OF ART AND SCIENCE

SERBIAN CHAPTER OF THE CLUB OF ROME

NEW KNOWLEDGE FOR THE 21 CENTURY

- **PRODUCTION CHANGE** Modern Economy, IT, not only mass production individual production tailored for specific needs is becoming more important

- **CONSEQUENCES:**

Individualized Education, Non Diploma Education, Open Source Education (MOOCs), Globalized Education, Planetary Identity (Harari, 2018)

General Evaluation Systems (TOEFEL, GRE; study.com)

Professional Evaluation Systems (Linked In, Google Scholar , Research Gate) brought Objectivity and Realism

- **NETWORKS** are way of communicating, way of thinking, way of acting in modern times

NETWORK THEORY - FOUNDATION OF MODERN THINKING

- **Network thinking is crucial for understanding of the World and the Society**
- Network Theory is based on views of two prominent Hungarian mathematicians: Paul Erdős and Alfréd Rényi started working together in 1948. They developed a mathematical framework of functioning of any interlinked group of entities (nodes) and links between them (edges).
- Later development of the Theory (Stanley Milgram, Mark Granovetter, Duncan Watts, Steven Strogatz....) enabled us to understand material networks, energy networks and information networks, giving us a powerful tool for comprehending Nature and Society (Albert-László Barabási)

SOCIETY/ECONOMY NETWORKS

- Economy - a network consisting of producers, consumers and their linkages
- Markets are networks. **Invisible hand of market is in fact a function of the NETWORK.** Rationality of market economy is a **network rationality** and is always higher than the sum of individual rationalities. (Surowiecki, 2005)
- Until recently economists viewed economy as a set of autonomous individuals that are linked via price system only. However, network perspective offers a different approach.
- Our education system should not ignore the fact that the more complex we are, the more we have to be interlinked.

SUSTAINABLE DEVELOPMENT IN A NETWORK PERSPECTIVE

- If we want to create and disseminate a viable and constructive knowledge for the 21st century we must stop using the 19th century paradigm of isolated and optimizing, perfectly rational individuals.
- “Whereas the 20th century was seen as century of physics, the 21st is often predicted to be a century of biology....it will most likely be a century of complexity”. (A.L.Barabasi, 2002) Complexity is a consequence of network structure of the Nature and Society.
- Sustainability concept is a network concept. SD goals are interconnected and they cannot be achieved separately. Understanding the interlinkages among the goals and between targets is crucial for integrated governance and policy coherence in implementing SD strategies.

SUSTAINABLE DEVELOPMENT GOALS AS A NETWORK OF TARGETS (DESA STUDY, LE BLANC 2015)

Department of Economic & Social Affairs

DESA Working Paper No. 141
SD/ESA/2015/DWP/141

March 2015

Towards integration at last? The sustainable development goals as a network of targets

David Le Blanc

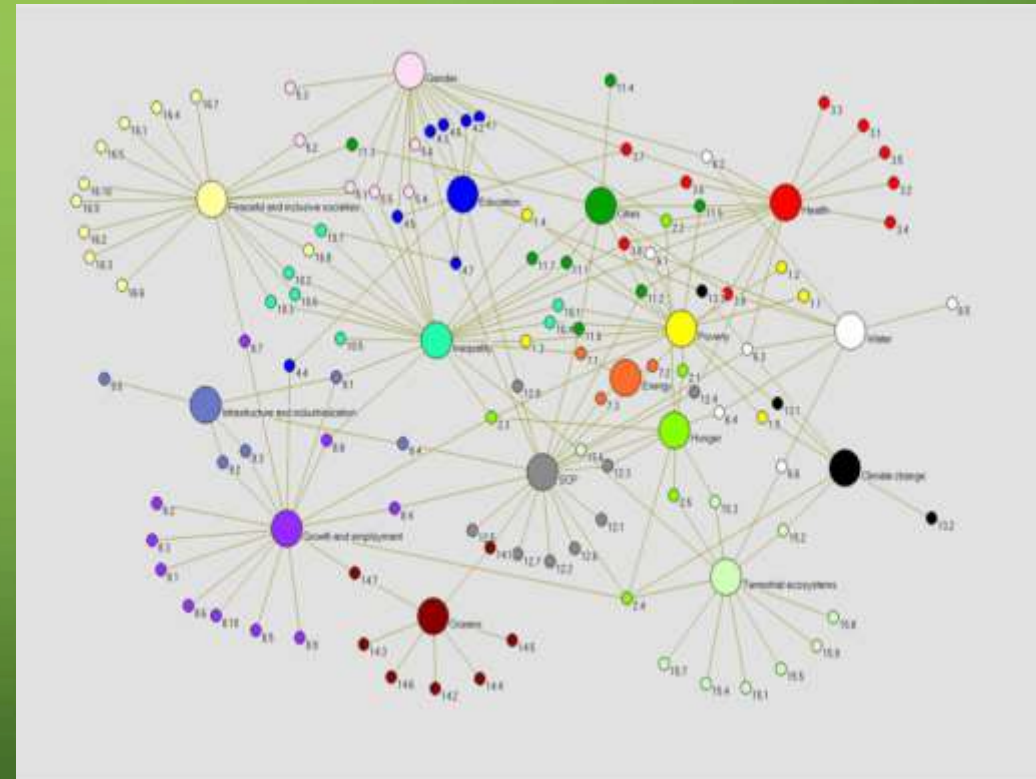
ABSTRACT

In 2014, UN Member States proposed a set of Sustainable Development Goals (SDGs), which will succeed the Millennium Development Goals (MDGs) as reference goals for the international development community for the period 2015–2030. The proposed goals and targets can be seen as a network, in which links among goals arise through targets that refer to multiple goals. Using network analysis techniques, we show that some thematic areas covered by the SDGs are well connected among one another. Other parts of the network have weaker connections with the rest of the system. The SDGs as a whole are a more integrated system than the MDGs were, which may facilitate policy integration across sectors. However, many of the links among goals that have been discontinued in biophysical, economic and social dimensions are not explicitly reflected in the SDGs. Beyond the added visibility that the SDGs provide to links among thematic areas, attempts at policy integration across various areas will have to be based on studies of the biophysical, social and economic systems.

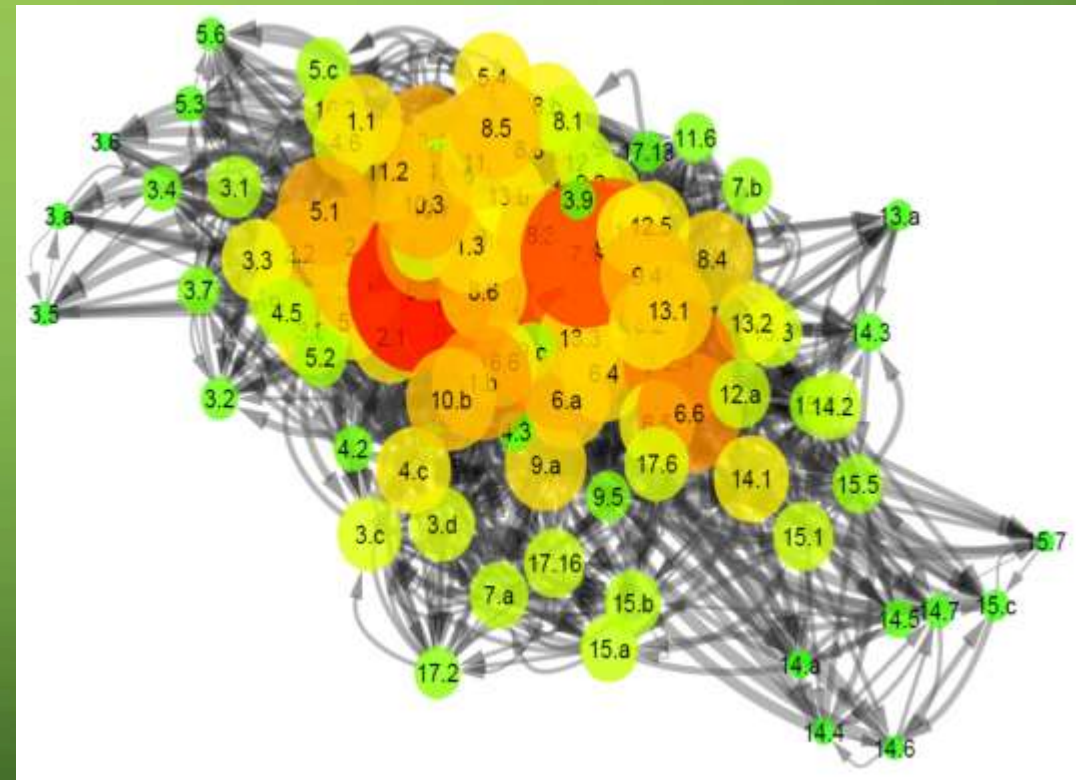
JEL Classification. O1 (Economic Development), O19 (International Linkages to Development, role of International Organizations), O30 (Development Planning and Policy; General).

Keywords. Sustainable Development Goals, SDGs, policy integration, sustainable development, development, science-policy interface.

David Le Blanc is Senior Sustainable Development Officer for the Division for Sustainable Development, United Nations Department of Economic and Social Affairs, UN DESA (dave@un.org).



A COMPLICATED NETWORK OF SDG INTERLINKAGES BETWEEN SDG TARGETS (ZHOU AND MOINUDDIN 2017)



NETWORKS AS SOURCES OF KNOWLEDGE

- In November 2009 an online, open source platform, **ClimateCoLab** was launched by MIT. The goal was to crowdsource the process of finding solution for the global climate change.
- Now it gathers more than 1 15 000 people, most scholars, interlinked in an effort to produce viable solutions on all levels, using various types of knowledge, benefitting from a multidisciplinary approach.
- By now ClimateCoLab participants have produced and evaluated more than 2000 proposals for how to solve many aspects of Climate Change.
- It is an example of innovative, productive and efficient use of networks for the global scientific progress.

HOW TO EDUCATE STUDENTS FOR IT?

- Network based education - Teachers as network administrators
- Modern knowledge largely depends on our ability to make networks or to join the existing networks. The more complex technology we use, less useful is individual knowledge. Ability of Networking (where to find knowledge, how to make network, how to be linked and with whom?)
- The most important routine in the 21st century is HOW and WITH WHOM to be linked. Matter of choice, Matter of trust, Matter of confidence.....
- **BUT MANY QUESTIONS STILL REMAIN.....**

HOW TO MOTIVATE STUDENTS TO JOIN THE EXISTING NETWORKS OR TO MAKE NEW?

- Motivation depends on a simple relation (benefit of being linked, **B** must be higher than costs, **C** of networking. **B>C**)
- **Benefit of networking** depends on the **VALUE OF NETWORK $V = n(n-1)$** n-number of nodes. The more nodes are, greater is the benefit of the network!
- **Costs of networking** = investment costs (creating or joining) + operation costs (maintaining linkage).

HOW TO BEHAVE IN A NETWORK ENVIRONMENT?

- Problems of trust.....How to find adequate sources and adequate information networks?
- How to comprehend the **network goals**? Is the network oriented towards the right goals or not? Matter of morality.....
- How to recognize the network structure? Matter of complexity.....
- How to communicate with the other network members (nodes)? Social skills....
- Is there an authority on the network? Who is **the authority** ?

MANY MORE QUESTIONS ARE TO BE ANSWERED.....BUT.....

- Networks are, and will remain being, a crucial component of the human existence.
- Networks are all around us, and we must be prepared to obtain the greatest benefit from networking. We have to try to avoid all the traps of networking.
- Educating students for the **INTERLINKED WORLD** is the only way to achieve a sustainable future for the Mankind and the Earth.

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