



Akiedu, Prosper; Boakye,  
Wendy; Akubia, John E.;  
Baghel, Ravi; Bruns, Antje  
**Stakeholder Report**  
**Science-Policy Workshop**  
**on Water and Energy**

The role of Water-Energy inter-  
linkages in the achievement of  
the Sustainable Development  
Goals (SDGs)

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### Authors' addresses

Prof. Dr. Antje Bruns

[brunsa@uni-trier.de](mailto:brunsa@uni-trier.de)

Governance and Sustainability Lab

Faculty VI - Regional and Environmental Sciences

Universität Trier

54286 Trier

# Abstract

This Working Paper documents the Science-Policy Workshop on Water and Energy held in Accra in early 2018. We have been particularly interested in exploring the Nexus between those basic supply sectors that are critically linked. Therefore, the Water-Energy-Food Nexus received within Academia and in the realm of politics increasing attention. In our workshop we discussed the Nexus from a Ghanaian perspective in a joint process with key stakeholders and decision makers in Ghana.

The framing of the workshop took place in the context of the SDG debate and local development challenges. In order to discuss whether the Nexus concept is of use on a policy level in the Ghanaian context, we invited various stakeholders from both the Water and Energy sector. Furthermore, we discussed the relevance and applicability of the SDG indicators for water and energy – and their shortcomings.



# The role of Water-Energy inter-linkages in the achievement of the Sustainable Development Goals (SDGs)

Akiedu, P.; Boakye, W.; Akubia, J.E., Baghel, R.; Bruns, A.

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**Table 1: List of Acronyms**

| <b>Acronym</b> | <b>Meaning</b>                                   |
|----------------|--|
| SDGs           | Sustainable Development Goals                    |
| GAMA           | Greater Accra Metropolitan Area                  |
| NDPC           | National Development Planning Commission         |
| EPA            | Environmental Protection Agency                  |
| WRC            | Water Resources Commission                       |
| IESS           | Institute for Environment and Sanitation Studies |
| NPA            | National Petroleum Authority                     |

**Table 2: Organising Team**

| <b>Name</b>               | <b>Institution</b>                                |
|---------------------------|---|
|                           |   |
| <b>Prof. Antje Bruns</b>  | Governance & Sustainability Lab, Trier University |
| <b>Prof. Chris Gordon</b> | Institute for Environment and Sanitation Studies  |
| <b>Dr. Ravi Baghel</b>    | Governance & Sustainability Lab, Trier University |
| <b>Dr. Adelina Mensah</b> | Institute for Environment and Sanitation Studies  |
| <b>Dr. Opoku Pabi</b>     | Institute for Environment and Sanitation Studies  |
| <b>John Edem Akubia</b>   | Governance & Sustainability Lab, Trier University |
| <b>Wendy Boakye</b>       | Institute for Environment and Sanitation Studies  |
| <b>Prosper Adiku</b>      | Institute for Environment and Sanitation Studies  |

## 1. Introduction

This Working Paper documents the Science-Policy Workshop on Water and Energy held in Accra in early 2018. The workshop took place in the context of the SDG debate and an increasing attention the Water-Energy Nexus concept receives in the academic realm. In order to discuss whether the Nexus concept is of use on a policy level in the Ghanaian context, we invited various stakeholders from both the Water and Energy sector. Furthermore, we discussed the relevance and applicability of the SDG indicators for water and energy – and their shortcomings.

The Water-Energy-Food Nexus has received increasing attention within Academia and in the realm of politics in the context of global socio-environmental change and arising challenges for sustainable development. Since the Bonn Conference in 2011, science and policy promote the Nexus concept. It is argued that the challenges regarding water and energy are inherently linked, which necessitates a holistic, multi-focus approach. Furthermore, so is argued, it is necessary to develop policies and integrating resource governance that are more resilient. Integrated governance strategies are necessary in order to adapt to increasing global urbanization, climate change and increasing individual demand for both water and energy across the globe. The Water-Energy Nexus attempts to create strategies through the “integration of multiple sectoral elements, such as energy, climate, water and food production within an overarching governance approach” (Benson, et al. 2015: 757). Specifically through “policy integration; governance; scale; participation; resource efficiency and sustainable development” (ibid.) of which the latter has been specified as several Sustainable Development goals as detailed in the second part of this paper.

While the Water-Energy Nexus shows similarities to other resource strategies such as Integrated Water Resources Management (IWRM) (cf. Hagemann, et al., 2017: 2), the focus of the Water-Energy Nexus approach is broader, aiming to balance water, energy and food supply as interconnected challenges (cf. ibid.).

This broader, linkage-focused approach has become the new, ultimate goal for resource management and it is hardly to disagree that it is necessary to promote the sustainable development of life essential resources.

As Allouche et al (2015: 610) put it “Although it is difficult to disagree with a vision of integration between water, food and energy systems, there are fewer consensuses about what it means in reality”. To get a first idea what it could mean in the Ghanaian context has been our main objective for the workshop.

## 2. Background to the Science-Policy Workshop on Water and Energy

Water and Energy are essential supply sectors that are equally important for human well-being and ecosystem integrity. Usually water and energy sectors have been managed independently from another, which could result in higher vulnerabilities, risks, insecurities and efficiency losses – and usually these disadvantages are not equally distributed within a society and between regions.

In an era of rapid urbanization which leads to an increase in demand but also increases inequalities between those who have and those who don't have access to reliable supply systems, the Nexus becomes even more important. A focus on new and existing inequalities is getting more and more important in the context of climate change and related vulnerabilities.

The design of resilient and sustainable development pathways requires to identify linkages and interactions between energy and water from a social science perspective.

As on the global policy level the Sustainable Development Goals (SDGs) have been adopted and the implementation phase is ongoing, we took this as a starting point to examine Goal 6 (Clean Water and Sanitation) and Goal 7 (Affordable and Clean Energy) in-depth. Specifically it was of interest how the indicators perform if a nexus perspective is applied – from a Ghanaian perspective.

The WATER AND ENERGY SCIENCE-POLICY WORKSHOP under the theme 'The role of Water-Energy interlinkages in the achievement of the Sustainable Development Goals (SDGs)', was focused on the complex interlinkages of the SDGs Water and Energy in Ghana by using a "nexus" approach. The transdisciplinary workshop brought together stakeholders focused on individual sectors and or SDGs in dialogue with each other to identify synergies, interlinkages and trade-offs between Goals 6 "Clean Water and Sanitation" and 7 "Affordable and Clean Energy".

Representatives from state agencies related to water, energy and development planning and the SDGs including the Water Resources Commission (WRC), Energy Commission, the National Development Planning (NDPC), the Environmental Protection Agency (EPA) and non-governmental organisations (NGOs), the private sector, as well as researchers attended the workshop. The participants discussed the types of target coordination (informal or more formally established and measurable) that offer the best synergies from the perspective of development cooperation.

### 1.1 The Institute for Environment and Sanitation Studies (IESS)

The Institute for Environment and Sanitation Studies ([IESS](#)), established in 2010 and currently part of the College of Basic and Applied Sciences (CBAS) of the University of Ghana (UG), was created at the request of the Government of Ghana in response to several drivers, enablers and outcomes that are key to the nation's development. The institute employs interdisciplinary



and participatory approaches to train future scientists, managers and decision makers who contribute to the protection, management and development of the country's environment and natural resources. In addition to its existing MPhil and PhD Environmental Science programmes, the institute recently established two new MPhil programmes - Sustainability Science and Environmental Sanitation - both of which target a wider range of practitioners and decision makers for achieving sustainable development nationally and within the region.

### **1.2 The Governance and Sustainability Lab, Trier University, Germany**

The Governance and Sustainability Lab is a research unit of Trier University (Germany). Thematically the lab analyses environmental governance processes. Part of the Lab is the research project [WaterPower](#) that examines the complex interplay between water, urbanisation and governance in Accra. The project is funded by the Federal Ministry of Research and Education of Germany, with IESS as a project partner. The WaterPower project is focused on analysing physical and social dimensions related to urban water security in the Greater Accra Metropolitan Area (GAMA) of Ghana.

### **1.3 Objectives of the Science-Policy Workshop on Water and Energy**

The WATER AND ENERGY SCIENCE-POLICY workshop was intended to bring to bear a stakeholder perspective from Ghana on the relevance of the indicators and targets of the SDG goals 6 and 7 and explore the potential collaborations for dealing with their interlinking issues in a way that promotes sustainable development.

Underlying assumption was that the whole SDG process evolved with little engagement of Southern countries and that accordingly the indicators might not reflect local realities and development challenges.

- The workshop was therefore designed to encourage dialogue between the various stakeholder groups.
- Co-develop a policy brief aimed at promoting collaboration aimed at the most achievable targets that lie at the nexus of water and energy as an output from the workshop.

At the opening of the Conference, Professor Chris Gordon, the Director of the Institute for Environment and Sanitation Studies (IESS) of the University of Ghana noted that Water and Energy issues are fundamentally wicked problems, in that, because of their complex nature, attempting to fix one part of the problem sometimes worsens another part of the problem. Noting that the complexity of the interlinkages of Targets and Actions of SDG 6 & 7 with the other SDGs is well-known, he bemoaned the fact that the international development community has drifted away from the core principles of the Paris Declaration of Aid Effectiveness in relation to the issues of marginalisation and of 'Voice and Accountability' (VA).

He called for a bottom-up and pro-poor perspective in the 'resetting' of water and energy security within the 2030 agenda to make them more relevant to those most marginalised (e.g. the poor subsistence farmer) who often

have limited options due to poor access to water and energy for food production and to help maintain health. For SDG 6 and 7 to be achieved ‘fundamental issues of which institutional designs can produce the accountability and legitimacy of earth system governance in a way that guarantees balances of interests and perspectives’ are required for all the SDGs and for all people. Admitting the need to use indicators that are relevant in the Ghanaian context to measure success in achieving the SDGs, he emphasised the role of buy-ins, true partnerships with communities and engaging with respect in a true trans-disciplinary manner as crucial in delivering the SDGs.

Professor Antje Bruns, Project head of WaterPower at Trier University, Germany, on her part noted that energy and water are equally important for human well-being and development. However, achieving energy and water security simultaneously is a huge challenge, especially in an era where urban areas are expanding rapidly in the face of lifestyle changes leading to increased stresses on resources and ecosystems. She reiterated the need to adapt to the local impacts of the global phenomenon of climate change, in a bid to fulfill the urgent and challenging need to make our socio-ecological systems more sustainable and resilient in the face of increasing competition over resources.

She further indicated that frequent power outages (locally known as *dum-sor*), water scarcity, and a fragmented infrastructure systems with many people relying on a supply (be it water or energy) beyond the network come along with huge inequalities in Ghana. These she noted are beyond technology and technological changes or easily reachable technological fixes. The questions to explore in addressing the challenges therefore include among others:

- Are there any windows of opportunity for policy change?
- Does the SDG process offer such a window of opportunity?

## 2. Presentations and Discussions

### 1.4 Presentation 1: Implementations of SDGs in Ghana

Speaker:

**Christine O. Asare**, Director/SEA & Legal Affairs, Environmental Protection Agency

Miss Asare explained in her presentation the progress made so far in the implementation of the SDGs in Ghana, indicating that between 2015 and 2017 awareness has been created, implementing structures have been put in place and planning processes (e.g. mapping SDGs to 2063 National Development Plans) established. A key issue raised in her presentation had to do with data inadequacies, she however noted that a three tier data system was in use in the implementation process.

She concluded her presentation by highlighting the linkage between government initiatives/policies & the SDGs citing flagship programs such as the 1 District – 1 Factory, Planting for Food and Jobs, Free Senior High Education and Affordable Housing (see **Appendix III.A**).

### 1.5 Presentation 2: The role of water-energy interlinkages in the achievement of the Sustainable Development Goals

Speakers:

**Dr. Ravi Baghel**, Governance & Sustainability Lab, Trier University, Germany

**Dr. Opoku Pabi**, IESS, University of Ghana

This presentation was focused on the water-energy interlinkages and how these relate to the achievement of the Sustainable Development Goals (SDGs). The presentation details water in relation to SDG 6 (Clean Water and Sanitation) and 7 (Affordable and Clean Energy). The presentation discussed the interlinkages between the SDGs, stressed the need for a careful understanding of the interlinkages to leverage progress and avoid regression by focusing on the interface of multiple goals to leverage efforts to advance on multiple fronts.

The presentation concluded that the WaterPower is using the Water security and Waterscapes in Accra as a case-study to challenge simplistic dualisms that address the missing links between global environmental change research and more context specific and localized studies (see Appendix III.B).

## 3. Plenary Presentations from Groups and Discussions

### 1.6 Group Feedbacks

The plenary presentations feature summaries of discussions held by the three different groups; Water, Energy and the Mixed (SDG 6 & 7 interlinkages) group. The Water and Energy groups assessed the relevance of each of the indicators of the SDGs 6 & 7 in terms of their suitability in the context of Ghana. The mixed group further assessed the interlinkages of the two goals and ranked them according to their importance using the Likert Scale. All the indicators for the SDGs 6 & 7 were found to be relevant in the Ghanaian context. The relevance and rankings are summarised in 3.2 below.

### 1.7 Relevance and ranking of the indicators SDG 6 and 7 in Ghana

The various indicators of the SDG goals 6 & 7 were ranked in order of relevance as follows; *Highest relevance (5)*, *Higher relevance (4)*, *High relevance (3)*, *Relevant (2)* and *Limited relevance (1)*

#### 1.7.1 Indicator 6.1.1: Proportion of population using safely managed drinking water services

This indicator was ranked as being of *highest relevance (5)* in the context of Ghana in view of the gap in the demand and supply of safe and affordable drinking water in rural and urban communities.

#### 1.7.2 Indicator 6.2.1: Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water

The indicator was ranked as being of *highest relevance (5)* for the country's development planning, as sanitation remains a big challenge in terms of adequacy and equitability of sanitation and hygiene for all.

**1.7.2.1 Indicator 6.3.1: Proportion of wastewater safely treated**

This was also ranked as being of the *highest relevance (5)*. The quality of the country's water resources is on the decline with the pollution of water bodies becoming increasingly worse as a result of our inability to implement and enforce the laws regarding the resources. Recycling implies multiple use, thus to support efforts that aim at averting further deterioration in water quality, newly developed communities should be encouraged through government policies to have wastewater treatment facilities in place.

**1.7.2.2 Indicator 6.3.2: Proportion of bodies of water with good ambient water quality**

This is of *highest relevance (5)* in the Ghanaian context in view of the increasing degradation of our aquatic ecosystems.

**1.7.2.3 Indicator 6.4.1: Change in water-use efficiency over time**

This indicator was ranked to be of *high relevance (3)* Wastage of water becomes an issue in Ghana and we need to change water use to achieve efficiency. We should consider other sources such as solar and thermal energy.

**1.7.2.4 Indicator 6.4.2: Level of water stress**

Freshwater withdrawal as a proportion of available freshwater resource: This is of a *high relevance (3)* due to the noticeable reductions in freshwater quantity.

**1.7.2.5 Indicator 6.5.1: Degree of integrated water resources management implementation (0- 100)**

This indicator is of *highest relevance (5)* to Ghana since there still exist challenges with full implementation of integrated water resources management at all levels, including transboundary cooperation although some successes have been chalked.

**1.7.2.6 Indicators 6.5.2 & 6.6.1: Proportion of transboundary basin area with an operational arrangement for water cooperation and Change in the extent of water-related ecosystems over time**

These indicators were determined to be of *higher (4)* and *high relevance (3)* in Ghana's context as it relates to some ongoing activities being carried out by the Water Resources Commission (WRC) of Ghana.

Indicator 6.a.1: Amount of water- and sanitation-related official development assistance that is part of a government-coordinated spending plan: This is of *high relevance (3)* for Ghana, unfortunately however, there appears to be no surviving wetland currently in Ghana to improve particularly with regards to capacity building and technologies.

Indicator 6.b.1: Proportion of local administrative units with established and operational policies and procedures for participation of local communities in

water and sanitation management: This is of *highest relevance (5)*, however, because Ghana has achieved middle income status, donor sources and international grants will reduce.

#### **1.7.3 Indicator 7.1.1: Proportion of population with access to electricity**

This is of *highest relevance (5)* as most rural areas are being provided with mechanical borehole systems that require electricity to operate. The expensive nature of electricity however meant that some community based water systems that use electricity end up being shut down.

#### **1.7.4 Indicator 7.1.2: Proportion of population with primary reliance on clean fuels and technology**

This is of *highest relevance (5)* through the promotion of clean and renewable energy e.g. solar power.

#### **1.7.5 Indicator 7.2.1: Renewable energy share in the total final energy consumption**

This is of the *highest relevance (5)* to the country, as encouraging renewable energy usage will help in cost reduction if proper cost benefit analyses are carried out along with efficient use.

#### **1.7.6 Indicator 7.3.1: Energy intensity measured in terms of primary energy and GDP**

This is of *highest relevance (5)* to Ghana. Achieving this indicator is however currently being hindered by data availability on energy efficiency (e.g. materials for energy conservation).

Indicator 7.a.1: International financial flows to developing countries in support of clean energy research and development and renewable energy production, including in hybrid systems: This indicator is of *higher relevance (4)* to Ghana. Achieving this are based on the ability to involve the energy sectors providing funds to existing research institutions to carry out research activities.

Indicator 7.b.1: Investments in energy efficiency as a proportion of GDP and the amount of foreign direct investment in financial transfer for infrastructure and technology to sustainable development services: This indicator is of *highest relevance (5)*, the expansion in the national electricity grid, promotion of the use of Liquefied Petroleum Gas (LPG) and the installation of community based mini-grid systems as well as solar systems are some of the efforts towards progress with regards to this indicator.

## 4. Water and Energy Interlinkages

The interlinkages in the indicators of SDGs 6 (Clean Water and Sanitation) and 7 (Affordable and Clean Energy) and their attendant concerns are listed out (Table 1) below.

**Table 3: Interlinked Water and Energy Issues**

| Interlinked Indicators | Interlinking Issue(s)  |
|------------------------|--|
| 6.1 & 7.1              | <ul style="list-style-type: none"> <li>• Need to produce water as well as treat it</li> <li>• Depends on renewable energy in water production and treatment to bring down cost</li> </ul>            |
| 6.3.1                  | <ul style="list-style-type: none"> <li>• Linkage in achieving safe treatment of waste water and energy. But to achieve this, renewable energy options are appropriate</li> </ul>                     |
| 6.4.2                  | <ul style="list-style-type: none"> <li>• Water stress could have serious implications for our energy mix</li> </ul>  |
| 6.a & 7.a              | <ul style="list-style-type: none"> <li>• There is a direct linkage between the two, the money from donors could help improve water and sanitation while achieving developing clean energy</li> </ul> |

## 5. Open Discussion

SDGs 6 & 7 are linked but one is a trigger to the other and vice versa. Water is more fundamental; judicious use of water will mean efficient use and maintenance of energy.

Restoration of impacted water resources should include restoration of the totality of nature's (watershed's) contribution to man (ecosystem services).

Not all targets and indicators have measurable methodologies and for that matter cannot be achieved through a quick fix.

Top-down approach to dealing with SDG related issues with lapses in government taking a centre stage.

Data availability constraints, and improvement in capacity are required to meet the SDG targets efficiently.

Within the Ghanaian context, energy is becoming a constraint to water production. Example: lack of electricity in some places. But where electricity is available, it is also expensive. This gives an indication of the extent to which natural resource supplies including water, is dependent on energy. It is therefore, more valuable to use decentralized infrastructure.

Although aspects of the SDGs are useful, some targets are inaccurately defined for the Ghanaian context. E.g. communal water is widely used across Ghana but this has not been adequately captured in the SDG. This implies that Ghana may have to design its own suitable targets consistent with global SDG targets. In this respect, some targets and indicators have been adapted because they do not directly fit into the Ghanaian context.

## 6. Key Indicators for Ghana for 6 & 7 (Top 5 linkage issue)

What kind of infrastructure should we develop or put in place (centralised, decentralised or circular systems for Ghana and how should it work at difference levels?

*Link between safer management of sanitation:* Focus on local communities, infrastructure should be electricity so these local communities can run local community water systems.

*Focus in rural communities' infrastructure should be more on renewables:* These should be more centralised system for managing these hence responsibility. Community managed systems create 'gate' keepers who need to be paid.

*Indicator on community managed water and energy infrastructure:* Focus on differentiated responsibility between rural-urban/formal and informal settlements in the urban areas.

*Indicators used comparatively suit the Ghanaian context, focus must be on these four categories;* rural, urban, urban marginalised and formal settlements etc. noting that energy and water must have an integrated approach.

*By ensuring a renewable energy mix,* there will be more achievables in the future considering transboundary issues among others.

## 7. Key issues for Policy

There are transboundary bodies such as West Africa Power Pool, Volta Basin Authority (VBA), and West Africa Gas Pipeline (WAGP) with transboundary energy agreements but apart from the water group (VBA etc.) the energy group do not talk to each other adequately. There is thus a critical need for:

→ Institutional strengthening

*Opening links of communication between Water and Energy groups:* The water and energy groups at the Assembly levels need to be engaged effectively as proposals for the development of such relate infrastructure are located in their jurisdiction and they have management responsibility. A particular case in question is the Tema Effluent System; as a result of poor engagement between the water and the energy, the effluent system is no longer functional as there are no funds to buy fuel to power the generators without which the aerators in the Effluent System will not function.

*Direct linkages with Community Water and Sanitation (CONIWAS):* Water Research Institute (WRI) is mandated to carry out research on surface water quality among others and reports to MESTI and even though these reports have implications for CONIWAS as institutions, they are under different ministry and do not have access to these reports; need to partner relevant institutions and market/disseminate research findings effectively.

For the purposes of the SDGs, there is the need for a secretariat for coordinating activities related to SDGs of institutions; there is cross sectoral planning team but need for such a group for the Activity/Implementation Phase.

The cross sectoral planning group is only stuck at the planning stage and is coordinated by the NDPC.

- There is a gap in governance structure at the middle, high-level ministerial and local level/district interactions are going on perfectly but same cannot be said of the necessary state agencies that will kick decisions into action. Cross sectoral issues should therefore be differentiated at the Governance level, at the District Assembly integration of cross-sectoral issues is taken care of by the District Assembly structures but the ineffectiveness of country level structures makes it difficult for the District level to integrate properly to achieve better results for the districts.

Cost-Benefit Analysis must be an important consideration in the implementation of critical alternative sources of energy and water solutions or infrastructure (e.g. the Teshie Desalination plant project and its attendant issues of cost, and pollution issues-Chemu and Teshie (most polluted sea water sites in Ghana).

- There is a need for a change in attitudes and journalists have a role to play, lack of awareness etc. nested issues need to be looked at together. For instance, some industries make efforts to reduce energy and water usage not because of profit but as mandatory operation issues though others use International best practices in the management of water and energy for their profit benefits but do not want to share these technologies.
- We need to let our politicians know that data and evidence are key in coming up with development in addition to the crucial need to ensure clarity in the communication of government policies.

## 8. Actions and Way forward

SDGs are statistically driven goals (statistics is critical behind the figures), there is need to sustain the structures having attained them statistically:

- Empowering local level people to take on responsibility on the SDGs so it's not always top down
- Capacity building is key: Need to give fiscal capacity to the districts to implement what they need to do (which are usually in line with the SDGs)
- Reverse engineering to improve local technologies for improved effectiveness
- Lapses in government (corruption inclusive)
- Partnerships/collaborations between CSOs, NGOs, and local and traditional authorities not only government agencies.
- Platforms for knowledge sharing



## 9. References and further reading

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## 10. Appendix I: Workshop Agenda

Table 4: Workshop Agenda

| Time          | Activity                                 | Responsibility  |
|---------------|--|---|
| 08:30 - 09:00 | Arrival and registration of participants |   |
| 09:00 - 10:30 | Opening remarks & Welcome                | Prof. Chris Gordon, IESS and Prof. Bruns, WaterPower Project              |
|               | Introductions                            | All participants  |
|               | Presentations                            | Christine Asare, EPA Ghana and Dr. Ravi Baghel, WaterPower Project        |
|               | Setting the Workshop Agenda              | Drs. Opoku Pabi, Adelina Mensah, IESS and Ravi Baghel (WaterPower)        |
| 11:00 - 11:30 | COFFEE BREAK & GROUP PICTURE             |   |
| 11:30 - 12:30 | Working Group and Discussion I           | All participants, facilitated by Drs. Opoku Pabi and Adelina Mensah, IESS |

|               |  |  |
|---------------|--|--|
|               | Assessing SDG 6 & 7 Indicators for the usefulness in the Ghanaian context<br><br>Assessing the interlinkages between Sustainable Development Goal 6 “Clean Water and Sanitation” and Goal 7 “Affordable and Clean Energy” in Ghana |  |
| 12:30 - 13:00 | Plenary to discuss findings of the various groups  |  |
| 13:00 - 14:00 | LUNCH BREAK  |  |
| 14:00 - 15:00 | Working Group and Discussion II  | All participants, facilitated by Drs. Opoku Pabi and Adeline Mensah, IESS                    |
| 15:00 - 15:30 | Plenary to bring together the groups   |  |
| 15:30 - 16:00 | COFFEE BREAK   |  |
| 16:00 - 16:30 | Plenary and Synthesis<br><br>Way Forward   | All participants, facilitated by John Edem Akubia (WaterPower)<br><br>Prof. Gordon and Bruns |

## 11. Appendix II: Invited participants

**Table 5: Invited participants**

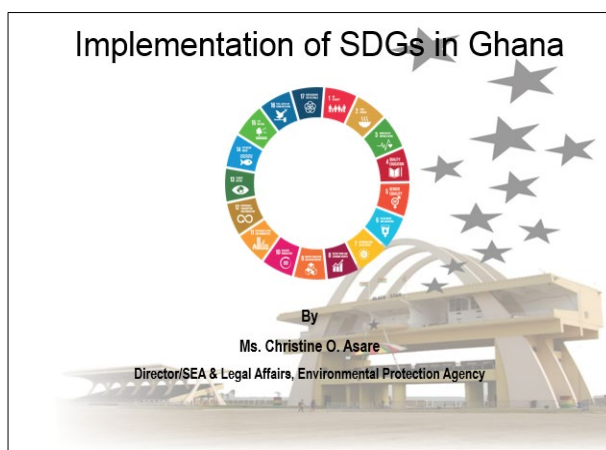
| #  | Name                    | Institution   |
|----|-------------------------|---|
| 1. | Addo Yobo Felix         | National Development Planning Commission (NDPC)                     |
| 2. | Addoquaye Tagoe Cynthia | Institute for Social, Statistical and Economic Research (ISSER), UG |
| 3. | Adjei Christopher       | Institute for Sustainable Energy & Environmental Solutions          |
| 4. | Alengah Cletus          | SDGs Advisory Unit, Office of the President                         |
| 5. | Ampomah Beryl Boadiwaa  | National Petroleum Authority (NPA)                                  |
| 6. | Anku Samuel             | Eco Management Consult  |
| 7. | Apawudza Prosper        | Ministry of Local Government  |
| 8. | Appiah Otoo Richard     | Ghana Water Company Ltd.  |
| 9. | Asare Okae Christine    | Environmental Protection Agency                                     |
| 10 | Asimah Esinam           | Climate Change & Sustainable Development (CCSD) UG                  |
| 11 | Atiegah Richard Rynics  | CCSD,UG   |

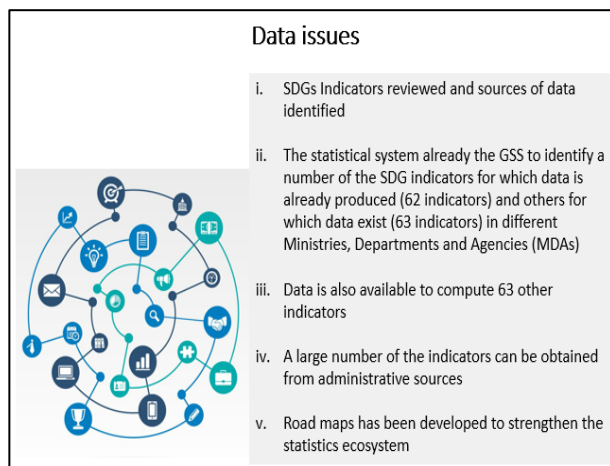
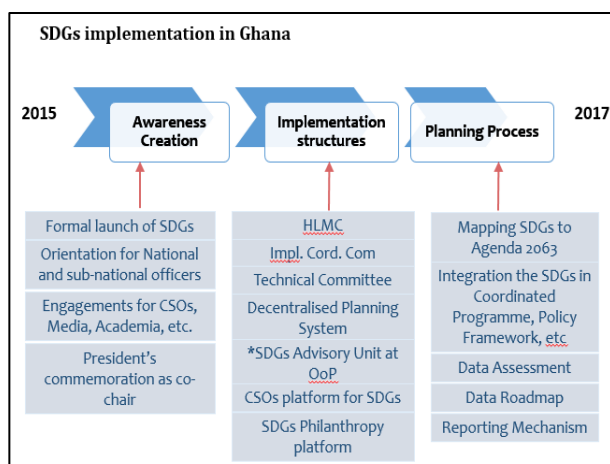
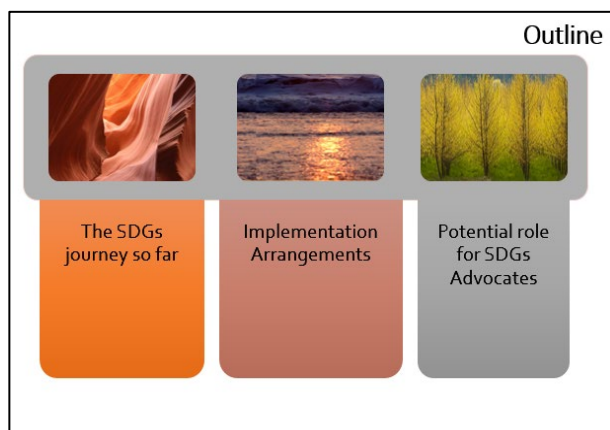
|    |                            |   |
|----|----------------------------|---|
| 12 | Djangba R. Monique Emefa   | Kumasi Institute of Technology, Energy & Environment      |
| 13 | Ebenezer Ocran             | Ghana Statistical Service                                 |
| 14 | Francis Amevenku           | Water Research Institute                                  |
| 15 | Gbeze Patience             | Ghana News Agency   |
| 16 | Issahaku Dawuda            | CCSD-UG   |
| 17 | Joseph Essandoh            | Energy Commission   |
| 18 | Kapaya Basetsana R.K.      | CCSD-UG   |
| 19 | Kofitio Theophilus Francis | Ghana Irrigation Development Authority                    |
| 20 | Kusorgbor Raymond L.       | UN Foundation Ghana Alliance for Clean Cookstoves & Fuels |
| 21 | Kyei Michael               | CCSD-UG   |
| 22 | Mark Ohene Nana Kwame      | University of Ghana                                       |
| 23 | Nelson Winfred             | National Development Planning Commission                  |
| 24 | Nutsukpo Delali            | Ministry of Food and Agriculture                          |
| 25 | Ofori Benjamin D.          | Institute for Environment & Sanitation Studies            |

## 12. Appendix III: Presentations

### 1.8 Implementation of SDGs in Ghana

Ms. Christine O. Asare Director/SEA & Legal Affairs, Environmental Protection Agency (EPA)





#### Some Notable SDGs Related Activities Undertaken/Ongoing



- i. Training on SDGs for key Government officials at National and sub-national levels
- ii. President's commemoration as co-chair
- iii. High Level Round Table meeting on SDGs
- iv. Multi-stakeholder Conference on SDGs
- v. Statistics Capacity Assessments (National, Regional and District levels)
- vi. SDGs Baseline Report
- vii. SDGs Communication Strategy

#### Other Activities

- National Data for Sustainable Development Roadmap Forum
- Co-hosting side event on data HLPF
- Co-hosting side events on data at UNGA
- Partnerships with NSOs
- Partnerships with Private Sector
- Collaboration with CSO Platform on SDGs
- Philanthropy platform on SDGs
- Ghana admitted as a member on the IAEG-SDGs

#### National Data Roadmap Advisory Committee

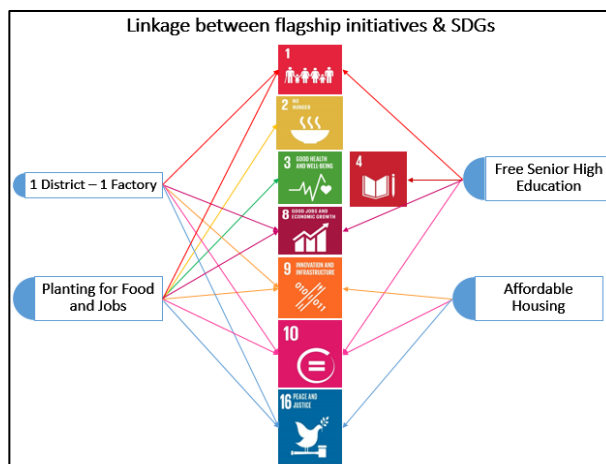
- Co-chaired by GSS and NDPC
- High-level members from key stakeholder institutions inside and outside government in the data ecosystem
- Oversight of all areas of the data ecosystem and implementation of the data roadmap- reduce duplication, increase impact and interlinkages
- Coordinate the work of the data work-streams focusing on various priority areas for action arising from the National Data Roadmap Forum and beyond i.e. spatial and environmental data, etc.

#### Data Roadmap Forum



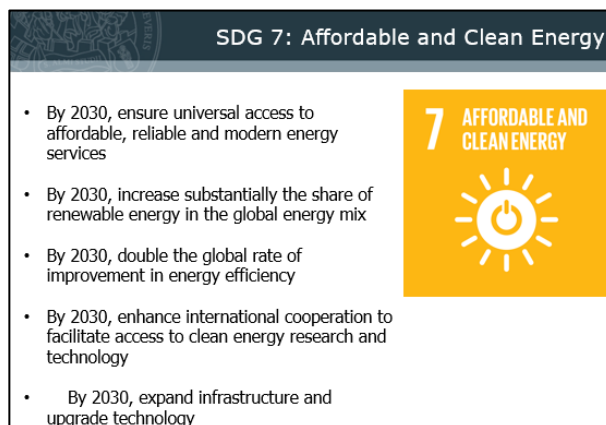
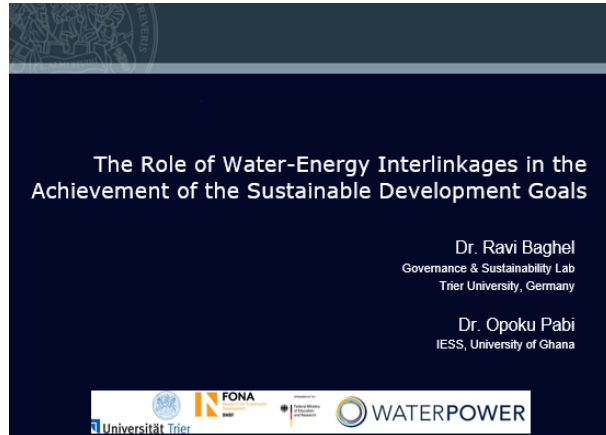
## Key Priority Areas for Action from Data Roadmap forum

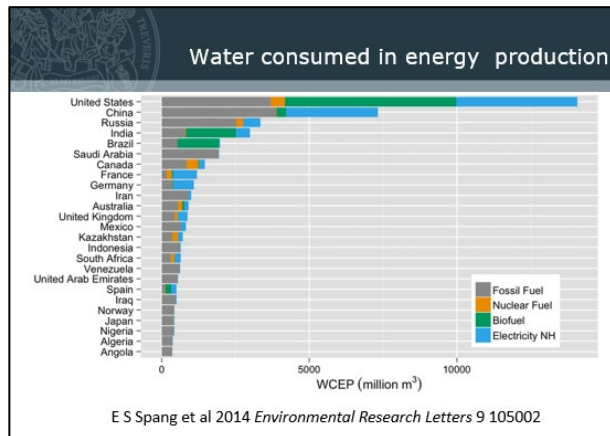
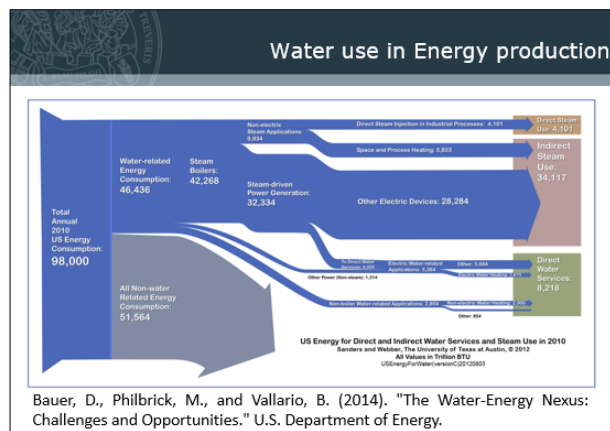
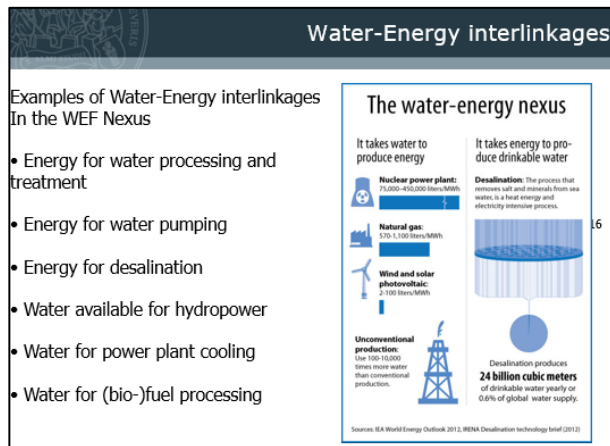
1. Addressing Data Gaps
  - Building administrative systems, strengthen censuses and surveys, explore the use of new types of data
2. Encouraging Data use
  - Make data more available, create a feedback loop between producers and users, provide training in key areas,
3. Strengthening the Data Ecosystem
  - Coordination and collaboration among stakeholders, establishment of strategic partnerships, create a harmonised policy environment and sustainably resource the data ecosystem
  - <https://www.youtube.com/watch?v=ZsplwShOtH0&t=232s>



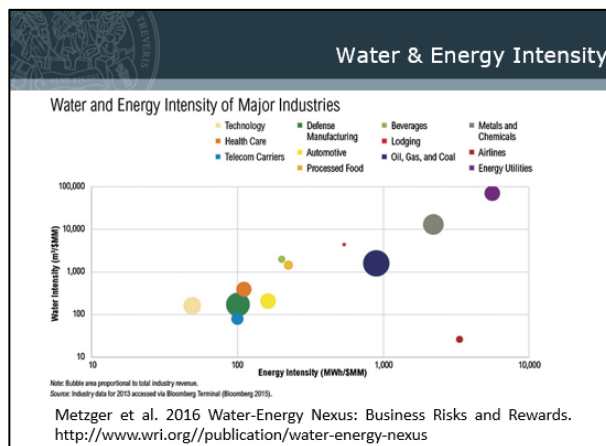
## 1.9 The Role of Water-Energy Interlinkages in the Achievement of the Sustainable Development Goals

Dr. Ravi Baghel; Governance & Sustainability Lab, Trier University, Germany  
& Dr. Opoku Pabi IESS, University of Ghana









### Water consumed by energy type

| Energy Type                                   | Water Consumed (m3/MWh) |
|---|-------------------------|
| Wind  | 0.001                   |
| Gas   | 1                       |
| Coal  | 2                       |
| Nuclear                                       | 2.5                     |
| Oil/Petrol                                    | 4                       |
| Hydropower                                    | 68                      |
| Bio-fuel, 1 <sup>st</sup> gen (corn, US)      | 184                     |
| Bio-fuel, 1 <sup>st</sup> gen (sugar, Brazil) | 293                     |

Source: EGU

- ### Interlinkages of SDGs
- The SDGs should **not** be considered distinct
  - SDGs are the most innovative Global Governance initiative at present
  - Focussing at the interface of multiple goals can leverage efforts to advance on multiple fronts
  - Interlinkages also mean that progress on one SDG may actually cause regression on another.
  - Careful understanding of interlinkages is required to leverage progress and avoid regression

- ### Some conclusions
- Water and energy have mutual exposures, sensitivities, enablers, constraints
  - The stronger interdependencies create stronger mutual sensitivities- renders dependent populations and economies vulnerable.
  - Scarcity creates mutual insecurities

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- Water and energy have mutual exposures, sensitivities, enablers, constraints
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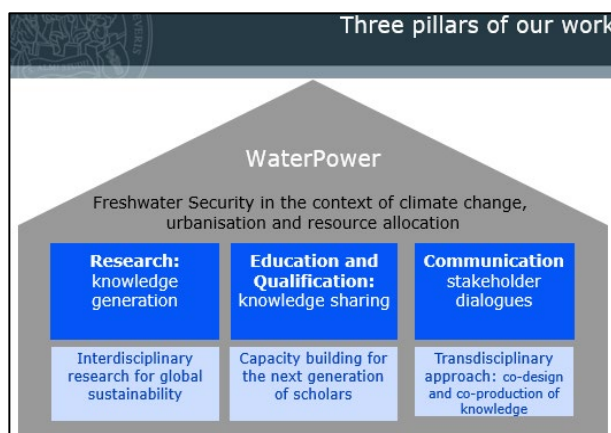
### Some questions

- What is the current and anticipated water and energy security (vis a vis demand and supply) in Ghana. How can availability be improved?
- Stressors and threats to the nexus of water and energy systems in Ghana?
- Strength of mutual interdependencies- reduce the amount of energy water and water energy requirements (improve efficiencies-)?
- Will current status, nature and strength of interdependencies allow for achieving SDGs?
- How should knowledge of the water-energy nexus implications shape and adapt existing policies, or inform new policy formulations to achieve SDGs 6 and 7.

### Focus of workshop

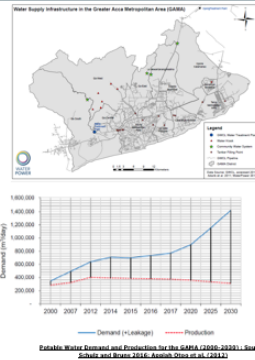
1. To bring together stakeholders who may be focused on separate SDGs into dialogue with one another
2. To co-develop a policy brief that can be disseminated and be used to promote collaboration and identify the most achievable targets that lie at the nexus of water and energy.

### Three pillars of our work



**Accra: rapidly urbanising coastal megacity**

- Accra – capital of Ghana, formerly Gold Coast
- Colonial resource extraction
- neo-colonial practises in knowledge generation
- Interconnected drivers of change
- Rapid urbanization and urban land use change
- Uneven access to water
- Unclear and complex land ownership
- Flooding
- Wetland degradation



**WaterPower is a laboratory for experimenting with novel ways of doing research** based on the integration of multiple disciplines, approaches, methods and non-academic knowledge through dialogue and collaboration.

We contribute to current debates on society-nature relations by mapping, analyzing and understanding processes that unfold in the urban water sphere.

Our analyses critically study the interplay of socio-political and ecological processes and how they configure place and scale.

**Governance and Sustainability Lab**

Faculty VI - Regional and Environmental Sciences

Prof. Dr. Antje Bruns

University of Trier

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