ROUNDTABLE FORUM

GLOBAL ACTION PLAN FOR AGRICULTURAL DIVERSIFICATION (GAPAD)

The Contribution of Agricultural Diversification to SDG7 of the UN Sustainable Development Agenda 2030

21-22 MARCH 2016 | KUALA LUMPUR,MALAYSIA

RAPPORTEUR REPORT

Co-organised by

With support from

RAPPORTEUR REPORT

ROUNDTABLE FORUM ON

GLOBAL ACTION PLAN FOR AGRICULTURAL DIVERSIFICATION (GAPAD)

The Contribution of Agricultural Diversification to SDG7 of the
United Nations Sustainable Development Agenda 2030
21-22 MARCH 2016 | KUALA LUMPUR, MALAYSIA

Table of Contents

Attendees

No.	Name	Organisation	21/3	22/3
1	Professor Sayed Azam-Ali	Crops For the Future	Y	Y
2	Mr Max Herriman	Crops For the Future	Y	Y
3	Professor Christine Ennew	University of Nottingham Malaysia Campus	Y	N
4	Professor Nigel Minton	University of Nottingham	Y	Y
5	Dr. Niall McNamara	Centre for Ecology and Hydrology	Y	Y
6	Dr. Rebecca Rowe	Centre for Ecology and Hydrology	Y	Y
7	Dr Hayden Marcollo	AMOG Consulting Pty. Ltd.	Y	Y
8	Mr Damitha Samarakoon	Janathakshan (Gte) Ltd.	Y	Y
9	Ms Lee Ching Heong	British High Commission, Malaysia	Y	Y
10	Mr Thorsten Schmidt	Malaysian-German Chamber of Commerce	Y	Y
11	Mr Martin Leuenberger	Leureko AG	Y	Y
12	Dr. Frédéric Beaudoin	Rothamsted Research	Y	Y
13	Dr. Kim Brooksbank	Department of Agriculture and Food (Western Australia)	Y	Y
14	Professor Denny K.S. Ng	University of Nottingham Malaysia Campus	Y	N
15	Professor Aik-Chin, Soh	Crops For the Future	Y	Y
16	Dr Sean Mayes	Crops For the Future	N	Y
17	Dr Salvatore Virdis	Crops For the Future	Y	N

Rapporteurs

1. Ms Advina Julkifle
2. Dr. Maysoun Mustafa
3. Ms Rossuraya Abdullah
4. Ms. Tiara Herman

Reports of the Discussions

Day One – 21 March 2016

Welcome and opening remarks

The Roundtable Forum on Global Action Plan for Agricultural Diversification (GAPAD): The Contribution of Agricultural Diversification to SDG7 of The United Nations Sustainable Development Agenda 2030 (SDA2030) was officiated by Prof Azam-Ali, CEO of Crops For the Future (CFF). He took the opportunity to thank the British High Commissioner (BHC) Kuala Lumpur and University of Nottingham Malaysia campus (UNMC) for their generous financial, intellectual and facilities support towards the success of the forum.

Prof Christine Ennew, Provost and Pro-Vice-Chancellor of The University of Nottingham Malaysia Campus (UNMC) welcomed the attendees and noted the importance of adopting SDA2030. This meeting lays the path for identifying and exploring actions to meet the 17 SDGs, of which SDG7 will be in focus for this session. SDG7 addresses energy, which plays a key role in the development agenda and is a transformative tool as can be witnessed through the large scale investments in hydroelectric power. However, the generation and distribution of energy is largely responsible for many of the challenges that we face today; hence the importance of addressing SDG7. GAPAD will go beyond SDG7 and contribute to addressing global issues of food, nutrition, biodiversity and climate change and UNMC is happy to partner with CFF on this initiative. In this context, Prof Ennew welcomed the organisation of the Roundtable Forum on GAPAD and thanked the British High Commission, AIRCA and CFF, indicating that GAPAD would contribute to solving many of the greatest challenges that are faced today.

Session 1: *Forum Moderator Welcome and Scene Setting*

Presentation on "GAPAD SDG7: Ensuring access to affordable, reliable, sustainable and modern energy for all; the role of agricultural diversification in a changing climate" by Prof. Sayed Azam-Ali, CEO of CFF

Prof Azam-Ali set the scene for discussion by introducing SDG7 and how GAPAD aims to tackle this goal. In summarising SDA2030 he noted that SDG1 (zero poverty) is the overarching SDG and that the other 16 SDGs should collectively contribute towards addressing SDG1. Thus, whilst the panel will discuss energy in this roundtable, ending poverty in all its forms will be their ultimate objective. It was also highlighted that emphasis should be placed on the second half of the title; "the role of agricultural diversification". Our increasing dependence on a narrow range of crops is highly risky, as any impact on any of the four main crops will be very detrimental on a global scale. The challenge is compounded by the fact that we face both a hotter climate and population growth to an estimated 9 billion people by 2050. Thus, by the end of these two days, it is up to the panel to propose a plan to meet SDG7 specifically in the context of agricultural diversification.

Group Introductions: *Who, from where, relevant experience to share*

Lee Ching Heong: from the Science and Innovation Office, British High Commission, Kuala Lumpur. Her key roles are to facilitate collaboration between science and research in Malaysia, UK and South East Asian nations through the Newton Fund which aims to establish partnerships, related to research, capacity building and innovation.

Denny Ng: a Professor at UNMC and the Founding Director of Centre of Sustainable Palm Oil Research (CESPOR). His research focuses on palm oil development and converting residues into economically and environmentally sustainable products.

Martin Leuenberger: is the CEO of a firm in Switzerland that delivers composting and fermentation services for the agricultural sector in Switzerland and biogas for the city of Basel.

Frédéric Beaudoin: represents the Director and Director of Science of Rothamsted Research. He is a crop scientist with extensive expertise on metabolic engineering for long chain fatty acids and is currently investigating non-GM solutions for improving agronomic traits. He noted that agricultural diversification will play a key role in renewable energy as the main energy crops today are also major food crops.

Kim Brooksbank: is from the Department of Agriculture in Western Australia which is characterised with a huge variety of ecosystems. His focus is on a specific region that grows barley and wheat and has only been farmed for the past 120 years but is currently encountering problems that include acidity, salinity, erosion, rising water tables. His work aims to stabilize the soils and help farmers in the region through expanding market options for their diversified agricultural activities.

Max Herriman: is the Director of FishPLUS Research Programme at CFF which aims to find an alternative to fishmeal through the use of insects that are fed on underutilised crops. He is also Head of Advisory and Consultancy Services Unit, and heads the taskforce for GAPAD Secretariat.

Aik Chin Soh: is the Advisor for Business and Strategy at CFF. His focus is on using waste from crops for biomass (palm oil being the main contributor in Malaysia), and is carrying out research on small scale gasification.

Nigel Minton: is a biologist at University of Nottingham, working on the production of chemicals C1 gasses as a feedstock for microbes. His group is also working on producing bioenergy from off-gas generated at steel mills. Their research is carried out at the Synthetic Biology Centre, and they believe that synthetic biology can produce chemicals of higher value than ethanol.

Niall McNamara: is a government research scientist at the Centre for Ecology and Hydrology (CEH), Lancaster, UK studying the impact of climate on soil processes and the potential for planting biomass crops. Their research investigates a range of perennial crops, and has built a process based models on temporal and spatial scales within UK.

Rebecca Rowe: is also a government research scientist at CEH and works on biochar, soil carbon and bioenergy crops, with emphasis on farmer's choice and the sustainability of crops.

Hayden Marcollo: is the Director of AMOG Technologies (AMOG's R&D arm) and AMOG Consulting Inc., Australia. He is involved in the design and delivery of projects and consultancy in energy industry on renewable energy and aquaculture.
Damitha Samarakoon: is the Project Manager for Janathakshan (Gte) Ltd, Sri Lanka. It is a community based organization that works on renewable sources of energy towards mitigating climate change and contributing to economic growth and poverty reduction.
Sayed Azam-Ali: is Chair in Global Food Security at The University of Nottingham, and has researched impact of climate change on tropical crops in Africa and India. He is currently the CEO of CFF.
Salvatore Virdis: is a Research Fellow at UNMC, with a research interest in geospatial science and environmental issues.

Session 2: *Roundtable Strategy*

2.1 Presentation on "Multi-stakeholder engagement: Webinar content and feedback" by Dr. Salvatore Virdis, CFF

The objective of the webinar was to generate stakeholder engagement in advance to the Roundtable Forum, featuring experts from academia, applied research and industry. The webinar featured three talks which addressed:

1) The fact that biomass cannot supply the world's energy needs alone. As such, specific research must be dedicated to Africa and South East Asia on developing alternatives, to avoid generalised recommendations/solutions.
2) Advances in the use of CAM (Crassulacean Acid Metabolism) crops in marginal lands and the interrelations between food, bioenergy and water.
3) Defining marginal lands, especially in Malaysia, and identifying renewable, sustainable and non-competitive non-food crop options such as Jatropha.

2.2 "Overview of SDA2030, and SDG7 & Targets: Rationale and purpose of the chosen scenarios" by Mr. Max Herriman, CFF

The panel was selected for their diverse input and wealth of experience and knowledge to produce a succinct plan towards developing a global action plan. The global action plan will work towards achieving the targets of the 2030 SDA, ensuring the contribution of agricultural diversification through GAPAD to this important framework. This plan will include specific and measurable outcomes, identifying key dates and the key actors in meeting seven of the 17 SDGs. The following roundtable was set up to discuss SDG7, with a focus on the contribution of biomass from a diversified agricultural base.

Summary of the targets to be achieved for SDG7 were identified as:

Target 7.1 *By 2030, ensure universal access to affordable, reliable and modern energy services:*
Time is imperative for achieving this target, which ensures universality of energy services.
Target 7.2 *By 2030, increase substantially share of renewable energy in the global energy mix*
There is a need to address the biomass share of energy in the renewable energy mix, and not simply increasing renewable energy mix in the global energy mix. Using Mexico as an example, biomass makes up more than half of renewable energy mix.
Target 7.3 *By 2030, double the global rate of improvement in energy efficiency*
The focus on this target is on *rate,* not just improvement.
Target 7.a *By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology*
The adoption of GAPAD can address this target, through the establishment of global fund access, linking governments and providing easier access for high risk investments.
Target 7.b *By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support*
This may require targeted research for specific agroecological zones with limited land mass e.g. small islands.

Session 3: *Moderated discussion I*

Presentation on "Measuring to modelling of field GHG (Greenhouse Gases) balances after bioenergy land use change", by Dr. Niall McNamara, CEH

Dr McNamara introduced research at Centre for Ecology and Hydrology on the sustainability of land use for perennial crops producing biofuel. The ecosystem land use modelling project was tasked with the development of a spatial model of UK, extending until 2050. Producing the spatial model involved field trials throughout the UK, on soil GHG emissions and biodiversity, and feeding the collected data into process based modelling. This modelling project includes 18 different scenarios for land use change, such as arable to bioenergy crops. It was developed to provide answers on what will happen upon land use change, ultimately providing recommendations on which crops to plant and where. Moreover, it is currently available as a tool for public access. It was noted that replacing arable crops with perennial bioenergy crops will increase carbon sequestration, while increasing grasslands gave mixed results. However, this introduces a question of competition for food.

Presentation on "A practical working group in bio-waste recycling", by Mr. Martin Leuenberger

Mr Leuenberger introduced his firm which operates on 40,000 tonnes of organic waste per year and produces biogas worth 16,000 tonnes a year, generating 9 million kWh a year. They make use of capturing energy from material trapped below soils, in a 14-day fermentation process that does not require the use of specific microbes. Animal waste, which has high ammonia content is not an efficient source of energy and is alternatively converted into compost. The European commission has called for a boost in the use of organic waste and waste based fertilisers.

Session 4: *Moderated discussion II*

Case Study Presentation on "Synthetic Biology Research Centre (SBRC)", by Prof. Nigel Minton

Prof Minton introduced the concept of producing C1 gases from diverse sources. At the synthetic Biology Research Centre research has been carried out with diverse microbes such as Clostridium, Geobacillus, Acetogens, Cupriavidus to turn biomass into biofuel. Carbon can be diverted into desirable products using the four different microbes, three different feedstocks, and under aerobic and anaerobic conditions. Moreover, through collaboration with the steel plant ArcelorMittal in Ghent, microbes are being tested to generate biofuel using off-gases from the steel plant. It was noted that the focus should not only be on the production of liquid transportation fuels, but also the production of other chemicals from these sources for our daily needs.

Case Study Presentation on" Renewable Energy Initiatives in Sri Lanka", by Mr. Damitha Samarakoon

Mr Samarakoon drew on parallels between Sri Lanka and Malaysia and the potential of biomass as a contributor in the circular economy of Malaysia. Coconut is a valuable commodity for export with good economic value, however does not offer any returns to the soil. This results in soil fertility decline and large scale application of fertilisers (which requires energy). Agricultural diversification and the use of biomass can contribute towards soil enrichment, as well as energy savings.

Another case study proposed by Mr Samarakoon was in relation to bioenergy using Jatropha as a model. Cultivation of this crop was largely encouraged by the Sri Lankan government. However, in monoculture systems the plant is more sensitive to diseases, which necessitates the need for agricultural diversification.

Although conventional economics may not support the adoption of bioenergy (cost comparison with convention diesel), through the contribution of such changes to the local community these solutions are justifiable. It was further noted that transition will be easier for countries such as Sri Lanka, where the economy has not fully transformed yet.

Case Study presentation on "Effects of landscape position on growth and water use of trees integrated into annual production systems in South Western Australia", by Dr. Kim Brooksbank

Dr Brooksbank described the agricultural production zones in the South Western Australia wheat belt, which is characterized by low rainfall and high heavy reliance on mechanisation. The area has been highly impacted by the clearing of the original vegetation, which resulted in rising water tables, increasing the soil salinity and soil erosion. Land remediation was carried out by introducing perennial components, primarily comprised of *Mallee Eucalyps*, which were able to hold the top soil and protect from wind erosion as well as control water tables and stop further encroachment of salinity. Mallees are adapted to the dry environment with minimal rainfall and high evaporation, and are characterised with a big lignin tuber for fast regeneration. Moreover, they have a potential to be used for jet fuel, however the market value for the Mallees is yet to be realised. Moreover, the multi-stem and expanding root nature of Mallees now pose a threat by shading other vegetation and stealing water. Thus the plant is now viewed as a major threat for local farming systems.

***

Prof. Azam-Ali identified that the current working groups have different understanding of 4 of the 5 targets in SDG7. The group was divided into four subgroups to define Targets 7.1, 7.2, 7.3 and 7.b:

Group 1: Ms Lee, Prof Ng, Mr Schmidt and Mr Leuenberger - Target 7.1: By 2030, ensure universal access to affordable, reliable and modern energy services
Group 2: Mr Herriman, Prof. Minton, Dr Beaudoin - Target 7.2: By 2030, increase substantially the share of renewable energy in the global energy mix
Group 3: Dr Brooksbank, Prof. Soh, Dr McNamara - Target 7.3: By 2030, double the global rate of improvement in energy efficiency
Group 4: Dr Rowe, Dr Marcollo, Mr Samarakoon - Target 7.b: By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support.

Session 5: *Discussion on definition for the targets of SDG7*

Target 7.1: *By 2030, ensure universal access to affordable, reliable and modern energy services*

The group identified the key terms in the target and defined them as following:
Access: universal and independent of geographical or political barriers
Affordable: predictable and stable, does not fluctuate like oil prices today. It also needs to be adjusted to the income of the people
Reliable: continuous, uninterrupted supply of energy, with no shortages. There is a need for a centralised system to ensure reliability.
Modern: renewable energy that is sustainable.
To justify the balance of income, it was suggested to use the benchmark of fossil fuel against the poverty line of each country.

Target 7.2: *By 2030, increase substantially the share of renewable energy in global energy mix*

The group acknowledged the absence of firm data to allow for measuring "substantial increases". As such the target would be redefined for GAPAD to "*at least double the percentage share of bioenergy in the global energy mix*". Substantial –how we may increase? If global is increasing faster than the renewable energy mix, then it is not substantial increase.

Target 7.3: *By 2030, double the global rate of improvement in energy efficiency*

The group posed the questions of how to define energy efficiency and how to measure it. It was recommended that this target needs be addressed at a national level, rather than globally.

Target 7.b: *By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support*

The group defined the key terms as following:
Modern energy: a reliable energy service that is available when needed, affordable and powers modern technologies, thereby providing access to knowledge based systems. These modern energy services also take into account implications of energy generation/distribution on health.
Technology: is dependent on location, infrastructure available and the population size, but needs to be made available with the correct knowledge for operating it when introduced to a new community.
Sustainable: does not harm the natural resources, environmental and the local economy

Day Two – 22 March 2016

Session 6: *Moderated discussion III*

Presentation on "Oilseed crops as integrated production platforms for food, feed, fuel and renewable industrial feedstock", by Dr. Frederic Beaudoin

Dr Beaudoin presented on ongoing research on the metabolic engineering of plant lipids for the production of multipurpose products from novel oil crops, at Rothamsted Research. The context of the research is to use existing crops (such as rapeseed and sunflower) to manipulate fatty acid content through non-GM approaches. This can also allow for the conversion of biomass crops (such as tobacco, maize and miscanthus) into oil crops. Further research has been done on understanding big complex traits of crops to improve the value of non-harvested co-products; allowing researchers/farmers to breed for content and composition. Dr Beaudoin commented that through these approaches a limited number of crops can be integrated into agricultural systems and as part of landscape management, while concomitantly producing multipurpose products: *diversification within one plant*.

Summary of Day One, Prof Sayed

Prof Azam-Ali highlighted the importance of addressing the SDGs, as they will be the drivers for international agendas and funding in the next 15 years. He noted that SDG2 (zero hunger), SDG7 (clean energy), SDG12 (sustainable consumption and production) and SDG15 (life on land) all lie within the umbrella of SDG1 (eradication of poverty). Together, these five SDGs address SDG13 (climate change) and can collectively be addressed through SDG17 (global partnership i.e. GAPAD). A second group breakout session was administered. The groups were instructed to propose an action plan for GAPAD in light of the following challenges:

1) Satisfying SDG7
2) Keeping temperature rise well below 2°C
3) The need to eradicate poverty in all its forms and dimensions
4) Exploiting agricultural diversification

Session 7: *Discussion on definition for the targets of SDG7 II*

Target 7.1: *By 2030, ensure universal access to affordable, reliable and modern energy services*

The group defined the problems, solutions and action plans for the key terms:

1) **Universal access**: is affected by distribution of services, infrastructure and technological limitations, population size and the political and geographical environments. The solutions to these identified issues involve microgeneration of energy, local generation of energy,

sharing of technologies/patents, and multi-lateral/government measures to ensure non-discriminatory access to energy services.

2) **Affordable:** this was defined in the context of generation of energy and individual access. Affordability of energy generation was noted to struggle due to technical expertise, commercial drivers, commercialisation costs, R &D costs, regulation and patenting. Meanwhile, affordability for individual access is limited by available income, the available energy markets and efficiency of energy services. Solutions for the former were identified as encouraging STEM and training, financial assistance (in the form of government subsidies, private investment and international funding), and administering economic and political regulation. Meanwhile, for the later, the solutions were identified as defining energy poverty, providing subsidies for users and imposing energy saving approaches.

3) **Reliable**: depends on the availability of feedstock, storage capacity, conversion efficiency, simplicity of the technology, stability and robustness of the generator/provider, and price stability. Addressing these issues will require continuous growth of crops, enhanced biomass storage capacities, enhanced energy storage capacities, R&D, single step energy conversion and consumer related interventions such as smart grid and understanding consumer behaviour.

4) **Modern energy services**: this is dependent on the infrastructure, distribution mechanisms, energy storage facilities, and adaptability to changes in energy and lifestyle trends. These can be addressed by economic regulation (e.g. service obligation and Clean Development Mechanisms), local generation, microgeneration, integration of mixed energy sources, and sharing of propriety information through new patenting systems and wider engagement.

Target 7.2: *By 2030, increase substantially the share of renewable energy in global energy mix*

By 2030, the optimum quantity of available global biomass supply is used to produce bioenergy at reduced GHG emissions to meet the demand. This will be achieved through the following:

1) By 2018, develop and publish GAPAD guidelines and principles on the use of crops and forest as bioenergy e.g. standardization of methodologies
2) Create a Bioenergy Scientific, Technical and Economic Research Advisory Panel (BESTE)
    a. Independent funding
    b. Visibility and publicized
    c. Charter for the panel
    d. Advise governments, treaty organisation, inter-governmental organisations
    e. Advise funders, banks on funding priorities

3) Create a global bioenergy fund to be nested in an existing financing mechanism
    a. For R&D and infrastructure
    b. Capacity building e.g. training
    c. Public awareness and outreach programs
4) By 2020, all signatories to GAPAD will lodge a national plan of action with GAPAD secretariat
5) Recognise the GAPAD Roundtable Forum on SDG7 as the GAPAD SDG7 Task Force
    a. Reconvene in August 2016 to review, revise and finalise the SDG7 component of GAPAD

Target 7.3: *By 2030, double the global rate of improvement in energy efficiency*

Energy efficiency was defined on a ratio basis for developed countries, and should be adapted for the specific location (energy use per unit GDP). The following recommendations were set:

1) Emissions should be cut at a whole system level and within the farming systems as well.
2) There should be clear distinction between the types of systems and agroecological zones for more appropriately scaled solutions.
3) It should be realised that there will be greater potential for improvements in developing nations as compared to developed nations.
4) The solutions will entail changing the way energy is generated and encouraging technology transfer at a global scale through the involvement of local farmers and establishing collectives based on agroecological zones.

Target 7.b: *By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support*

The group defined the key terms in addressing Target 7.B as follows:

1) **Infrastructure:** this entails access, storage, transport, knowledge transfer and the selection of technology that is economically and environmentally friendly.
2) **Upgrade technology:** acquiring / creating technology for energy services, as well as agricultural technology with the relevant knowledge transfer
3) **Modern energy services:** these are energy services that are safe for health, available when needed, fitting/relevant to the lifestyle and knowledge demands. Furthermore, if the source of energy is from an element of basic need, the basic need must be met first.
4) The importance of collecting information from these communities on their current knowledge systems, infrastructure and energy services was highlighted by the group. Moreover, it was recommended that when bioenergy may not serve as optimal solutions for the community, diversifying food supply should be adopted.

Mr Herriman summarised the points from the previous session, before a third breakout session in which proposed recommendations need to be revisited to explicitly detail the following:

1) Deadline
2) Required mechanisms for delivery
3) Identify who the recommendation targets
4) Prioritise the proposed actions accordingly (critical to optional)

Session 8: *Discussion on action plan for the targets of SDG7*

Target 7.1: *By 2030, ensure universal access to affordable, reliable and modern energy services*

The action plan for Target 7.1 was divided into three phases:

1. R&D:
    a) Analysis of case studies to inform concept development by September 2016 using available resources e.g. UK's Competition Committee
    b) Consultation with stakeholders from industry, technical advancement, academia and consumers by June 2017
    c) Ongoing promotion of GAPAD
    4) Strengthening the knowledge base for agricultural research that supports GAPAD through funding schemes, institutional links, and education to be launched by December 2017
    d) Set up a dedicated GAPAD secretariat by December 2017. Initial project ends by December 2020.
2. Development:
    a) Develop GAPAD policies informed by evidence gathered through 1.1 by December 2016
    b) Decision of adoption by FAO (post December 2016)
    c) CBD/FAO led high level meeting to develop plans for implementation
3. Delivery:
    a) Initiation of pilot studies to test acceptability and feasibility of technologies
    b) Develop a network of farmers to pilot/champion the technologies

Target 7.2: *By 2030, increase substantially the share of renewable energy in global energy mix*

The following action plan was recommended for Target 7.2:

1. By 2017, develop and publish GAPAD Guidelines and Principles on the use of crops and forest as bioenergy e.g. standardisation of methodologies; principle of no-food crop; principle of marginal-land production only.

2. By mid-2017, create a Bioenergy Scientific, Technical and Economics Research Advisory Panel (BESTE), entailing the following:
    a) Should have independent funding
    b) Should have appropriate visibility and be well-publicised
    c) Develop a Charter for the Panel i.e. remit of the Panel – draft by Dec 2016
    d) Will advise Governments, treaty organisations, inter-governmental organisations
    e) Will also advise funders and banks on funding priorities
3. By 2018, create a Global Bioenergy Fund to be administered by the International Renewable Energy Agency (IRENA);
    a) The Fund can be for R&D, infrastructure
    b) A certain percentage of the Fund to be dedicated for capacity building i.e. educational mechanisms such as training programmes, university courses
    c) A certain percentage of the Fund to be allocated for public awareness and outreach programmes for bioenergy
    d) By Q3 2017, to establish engagement with IRENA
4. By 2019, all signatories to GAPAD will lodge a national plan of action with GAPAD Secretariat.
5. Recognise the GAPAD Roundtable Forum on SDG7 as the GAPAD SDG7 Task Force. The Task Force to re-convene at a mutually convenient time in August 2016 to review, revise and finalise the SDG7 component for GAPAD.

Target 7.3: *By 2030, double the global rate of improvement in energy efficiency*

The action plans for Target 7.3 was set as follows:

1. Change the way energy is generated towards efficiency
    a) Collate emission-based information on bioenergy options
2. Enable technology transfer at a global scale to encourage accessing information from outside
    a) Identify a leading farmer/business/research team to help in technology transfer
    b) Formation of collectives/working groups based on agroecological zones (e.g. Tropical, Mediterranean collectives), aid budget and fund matching
    c) Optimising the system for different locations as a versatile tool kit

3. Curtailing fossil fuel subsidies
    a) Cutting down or even doing away with subsidies/ providing incentives to encourage people to improve energy efficiency
    b) Implementing fossil fuel taxation

Target 7.b: *By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support*

Four strategic areas were identified for the actions plans suggested for Target 7.B:

1. Identifying the "Dream" crops
    a) Local or introduced species, but not limited to terrestrial crops
    b) It has to do well in the climate and climate change proof
    c) Low input (e.g. less fertiliser application, nitrogen fixing)
    d) Not competing with food, feed, and other agriculture crops
    e) Multipurpose crop (energy, food, bio products) with demonstrated other added value for market.
    f) Non invasive
    g) Any proposed GM crops must not have negative impact to environment, health or system
2. Linking to Poverty (Economic solution)
    a) To create a system for local market, resources, knowledge
    b) Enable the sale of technology or biomass resources to others
    c) Crops must be able to increase income without replacing
3. Creating mechanisms for funding programme focusing on:
    a) Research
    b) Economic benefit
    c) For the local
    d) Sustainability
4. Target
    a) Prioritisation of carbon intensive area and quickest to fix
    b) Developed country to focus on bioenergy, but flexibility for under-developed to use fossil fuel

Closing Remarks

Prof Azam-Ali closed the session by reiterating the proposal to maintain the group as a cohesive unit "SDG7 Task Force". Following the completion of the Roundtable Forum, a proposal will be circulated to the group members and a virtual meeting arranged to discuss the proposal and identify stakeholders. The following step will involve the development of a Global Action Plan, with the other SDG taskforces following along the same path. The compiled GAPAD for all addressed SDGs will be reviewed by the task forces to ensure complementarity with each other.