NATCOM-UNESCO Organise National Conference to Stimulate Stem in Youth in Nigeria for Sustainable Development

Nigerian National Commission for UNESCO in collaboration with UNESCO has organized a three-day National Conference on Youth-in-Science and Technology; Sustaining Youth in Science and Technology to enhance interest in STEM for Sustainable Development. The Conference which took place at the Nigerian Army Resource Centre Asokoro Abuja the Federal Capital Territory from the 3rd to 5th of October 2023 was attended by youths in Science and Technology, teachers and education professionals and students from secondary schools, tertiary institutions, Universities and Colleges of Education from across the country. In his welcome remarks the Director, Educational Planning, Research and Development, Federal Ministry of Education, Mr. Adeleye Adeoye who was ably represented by Mrs. Khadijah Liman, Director, Education Planning Division welcomed all the participant to the three-day National Conference on youth-in-Science and Technology to enhance Interest in STEM for Sustainable Development. According to him, STEM is just not one discipline but rather a combination of Science, Technology, Engineering and Mathematics. He said that STEM is an education approach that unites the disciplines into one structured programme in which the application of knowledge and skills are integrated through in-context projects or problems focused on learning outcomes. He said the goal is to encourage students to develop science-based skills and frameworks so they can evaluate complex issues, communicate arguments and understandings and contribute to a technology driven society. 'UNESCO believes that Science, Technology, Engineering and Mathematics (STEM) courses are essential to help prepare youths for the future. The Director explained that this conference is very apt at this time because of the need to close inequalities in access to quality and relevant STEM research, education and learning between the developed and the developing world to stimulate and sustain learners interests and engagement in STEM subjects, strengthen governance frameworks, content and teacher capacity and close gender gaps in STEM studies and careers.

Mr. Adeoye thanked the Nigerian National Commission for UNESCO for coming up with this initiative at a time like this when the world is facing myriads of global challenges while believing that the Conference will not only re-kindle in the youth the passion for creating more innovative approaches to teaching and learning of STEM subjects but will also sustain the interest for many more years to come. In his overview statement the Secretary -General NATCOM-UNESCO, Dr. Lateef Olagunju enjoined the participants to be focused and try as much as possible to get the best out of the Conference which according to him is to spur their interest in STEM subject so that they can see a future that is sustainable. According to him the 3 day conference is loaded with over 14 topics that are aimed at equipping the youth and teachers with the requisite 21st century skills such as critical thinking, creativity, collaboration and problem solving to help develop, elaborate and provide innovative solutions to global issues directly related to 2030 Sustainable Development Goals. While also making his remarks the Officer-In-Charge UNESCO Office, Abuja, Mr. Dimitri Sanga who is also the Director, Dakar Regional Office and OIC Abuja Regional Office welcomed all the participants to the National Conference whose focus is on Youth in Science, Technology and innovation. Dr. Enang Moma, who spoke on behalf of the Director on behalf of the UNESCO Office Abuja said 'It is well known that capacity in

science, technology and innovation is a key innovation is a key element in economic and social development and for achieving the 2030 sustainable development goals. He said that promoting Science, Technology, Engineering and Mathematics (STEM) education at all educational levels is fundamental requirement to building a country's capacity in STI. He explained that STEM is especially important for developing countries including Nigeria as it helps to build up a critical mass of scientists, researchers and engineers which are needed for sustainable development and addressing critical environmental and health challenges. He said further 'As you may have observed there are now rapid technological advancements in artificial intelligence as well as other advancing technologies such as robotics and cloud computing all of which are transforming disciplines, economies and industries characterized by human/machine collaboration.'

The OIC said that UNESCO believes that Science, Technology, Engineering and Mathematics (STEM) courses are essential to help prepare youth for the future as application of artificial intelligence are already part of our daily lives. He however regretted that reports have observed that in some countries particularly in sub- Saharan Africa, Nigeria inclusive there is paucity of courses and curriculum as well as low enrolment in STEM, basic sciences, computer science and Artificial Intelligence. Mr. Dimitri Sanga further said 'Giving this seemingly weak STEM outlook, UNESCO has been working with its member states to ensure a vibrant STEM education in terms of human capacity, content, teaching/learning tools and right STI policies giving particular emphasis to encouraging young people and young girl to pursue careers in STEM'. He revealed that since 2005, UNESCO programmes in micro science, robotics and capacity building in computer sciences have been able to reach out to teachers and students in Africa and elsewhere to develop soft skills of doing hands-on scientific experiments, often when schools don't even have basic laboratories.' Mr. Dimitri finally appreciated all the young science students, teachers and distinguished participants for their commitment and implore them to make the best use of the content of the conference and promised that UNESCO stands ready to give technical support to all follow-up actions arising from the conference. In his opening remark the Permanent Secretary Mr David Andrew Adejo, represented by Mr. Isah Abubakar, Director ICT Department said that the wole essence of the 3 days Conference is to kindle the interest to kindle youths' interests in a wide variety of scientific innovations and to create awareness on various roles of science, technology, engineering and Mathematics in National Development. He said futher that the conference will expose participants to innovative approaches in teaching and learning of STEM subjects as well as to sensitize youth on the application of science, technology, engineering and mathematics According to him the conference will inspire lifelong engagement in Science ,Technology, and Engineering, Mathematics and motivating students. He thereafter declared the conference open.

The Three-Day Conference brought together Eighty participants and provided opportunities to bring together students, teachers and education practitioners to discuss what is working and what can be scaled up to positively inspire and sustain more youths in

the field of STEM. The technical sessions comprised of Fourteen (14) intensive and loaded topics presented by seasoned speakers in and outside the Federal Capital Territory. At the end of the sessions, the participants noted a range of challenges like inadequate scientific tools and infrastructure, inadequate remuneration of STEM teachers among others. Following the exhaustive presentations of the papers, followed by interactive sessions of questions and answers;

The conference led to the recognition of several basic facts:

A (i) STEM education is important for countries to achieve the Agenda 2030; (ii) In our ever-evolving society, technology stands as a powerful catalyst for change; (iii) STEM education in its entirety emphasizes the use of modern technologies and scientific innovations for the purpose of building a sustainable future; (iv) There is a gender gap; under-representation of girls and women in STEM; (v) Sustainable development can only be achieved when women have equal access to scientific information and careers; (vi) There should be increased advocacy on the importance and relevance of STEM to national development; (vii) IT enhances STEM and in-turn supports National Development; (viii) Youths are the custodians of the power of creativity for national development and should be involved in decision making processes;

The conference generated several recommendations:

B. For Educational Institutions/Learners/Teachers:

(i) Learners' needs should be taken into consideration when drafting curriculum; (ii) There should be mutual teacher-learner relationship; (iii) Educational institutions should equip their laboratories and libraries with advanced learning materials that will aid the learning and teaching of STEM subjects; (iv) Educational institutions should come up with innovative methods for science teaching in order to encourage and sustain learners' interest in STEM; (v) After-school projects, clubs, field trips and other extra-curricular activities should be encouraged to enhance school-based learning and cultivate learning behind school walls; (vi) Female role models in STEM fields should be introduced in schools, to motivate and encourage female students into taking up careers in STEM; (vii) Scholarships and

incentive programmes can be offered to educational institutions by organizations, universities and private sectors, towards attracting more females into STEM fields; (viii) Online tools to support hands-on learning should be integrated into the teaching practice to develop skills and competencies in STEM; (ix) Youths should be adequately mentored and prepared to participate at both National and International STEM competitions; (x) Continuous professional development of teachers should be encouraged in order to upskill their knowledge in the modern trend of teaching STEM education, Robotics skills and programming languages; (xi) Students' scientific projects and innovations should always be recorded and publicized; (xii) To ensure that the school system at all levels turn out graduates that will be relevant in the society, Robotics and AI should be part of the STEM curricula; (xiii) Educational institutions should be structured to be accommodating for vulnerable groups, including those that are specially abled; (xiv) Administrators of schools should appreciate and reward their teachers so as to optimize their commitment, creativity and achievement; (xv) Educational Administrators should be willing to drive/sustain the integration of robotics/AI into the STEM curriculum; and (xvi) Academic schedule should be adjusted, to include library time.

C. For Federal Government/Relevant Agencies/Stakeholders;

(i) Youths should be engaged in STEM through the non-formal and informal methods, to spark their interest and promote continued passion for STEM disciplines; (ii) Stakeholders should champion education initiatives to recognize their profound impact in shaping the future of STEM; (iii) There is need to draft and develop a national STEM curriculum in line with national development vision, relevant to times and meeting the needs of the citizens; (iv) Data gathering should be improved on so as to have accuracy data collation on STEM statistics in the country; (v) Government should make STEM education more interesting through awards of scholarships and other incentives; (vi) More platforms should be created for women to thrive at work while doing their family duties; (vii) There should be a paradigm shift in focusing on gender inclusion in STEM education; (viii) Government should develop STEM monitoring and evaluation framework and increase funding, in order to adequately map out an ecosystem for direct investment and other interventions; (ix) Stakeholders should introduce and improve relevant capacity programme for youth through vocational and entrepreneurship training, with focus on the unskilled and the artisans; (x) Stakeholders should pursue an aggressive technology transfer in relation to AI, Robotics and ICT in education through the organization of Robotic Technology, Coding, project based learning and life-long learning programs in Colleges; (xi) Partnership with NGOs, Aid Agencies, CSOs and Community Base Organizations (CBOs) should be encouraged to accelerate STEM learning; (xii) Monitoring and evaluation mechanisms should be developed to assess the impact of non-formal programs; (xiii) The government should improve on teachers' welfare conditions as stated in the National Policy on Education; (xiv) There should be adequate provision of appropriate robotics platforms/kits, books and online resources at all levels of education; (xv) Youths should be engaged in policy design, policy implementation, and policy review; and (xvi) All aspects of arts should be incorporated into the teaching and learning of science-related subjects, as the focus should go beyond STEM to STEAM – Science, Technology, Engineering, Arts and Mathematics. Conclusively, recognizing the profound impact of STEM education in shaping the future, achieving all other SDGs and positioning the Giant of Africa on the global developmental scale; everyone must proactively explore ways to harness the power of its youth to achieve the goals and objectives of STEM education. This should start