



## THE PONTIFICAL ACADEMY OF SCIENCES

“Children and Sustainable Development: A Challenge for Education” 13-15  
November 2015 • Casina Pio IV • Vatican City

### “Evidence Based Education and the UN Sustainable Development Goals (SDGs) 2016-2030”

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#### 1.0 Introduction

The UN Summit General Assembly unanimously approved the 17 UN Sustainable Development Goals (SDGs) on 27 September 2015. The SDGs 2016-2030 will replace the UN Millennium Development Goals (MDGs) 2000-2015. They will be the focus of the UN post-2015 development agenda.

#### 2.0 The UN Sustainable Development Goals (SDGs) 2016-2030

The 17 UN SDGs are:

- Goal 1: End poverty in all its forms everywhere;
- Goal 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture;
- Goal 3: Ensure healthy lives and promote well-being for all at all ages;
- Goal 4: Ensure inclusive and equitable quality education and promote life-long learning opportunities for all;
- Goal 5: Achieve gender equality and empower all women and girls;
- Goal 6: Ensure availability and sustainable management of water and sanitation for all;
- Goal 7: Ensure access to affordable, reliable, sustainable, and modern energy for all;
- Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all;
- Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation;
- Goal 10: Reduce inequality within and among countries;
- Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable;
- Goal 12: Ensure sustainable consumption and production patterns;
- Goal 13: Take urgent action to combat climate change and its impacts;
- Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development;

Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss;

Goal 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels;

Goal 17: Strengthen the means of implementation and revitalize the global partnership for sustainable development.

There are 169 targets associated with the 17 SDGs. I would urge all delegates to have a thorough grasp of the SDGs and the associated targets, as any meaningful discussion on sustainable development should use the SDGs and the targets as the frame.

<http://www.un.org/sustainabledevelopment/sustainable-development-goals/>

The SDGs are holistic and cross-disciplinary in scope, and multi-stakeholder in participation. They break new ground with additional goals on inequalities, economic growth, decent jobs, cities and human settlements, industrialization, energy, climate change, sustainable consumption and production, peace, justice and institutions. The SDGs boldly proclaim the end of global poverty by 2030.

The SDGs are the outcome of an inclusive consultation involving all UN member states, the entire UN system, experts, civil society, business and millions of people from all corners of the world since Rio+20 in 2012. By December 2014, the multi-stakeholder consultation process was completed with UN Secretary-General Ban Ki-Moon issuing his synthesis report on the post-2015 development agenda entitled “The Road to Dignity by 2030: Ending Poverty, Transforming All Lives and Protecting the Planet”. I would urge all delegates to study the synthesis report in order to understand the consultation process by which the SDGs are finally agreed upon. The synthesis report also contains many useful references. [http://sustainabledevelopment.un.org/content/documents/5527SR\\_advance%20unedited\\_final.pdf](http://sustainabledevelopment.un.org/content/documents/5527SR_advance%20unedited_final.pdf)

The UN Sec-Gen synthesis report emphasizes the importance of technology in achieving the SDGs by 2030.

*“In two decades since 1990, the world has halved extreme poverty, lifting 700 million out of extreme poverty. Between 2000 and 2010, an estimated 3.3 million deaths from malaria were averted, and 22 million lives were saved from fighting tuberculosis. Access to antiretroviral therapy has saved 6.6 million lives since 1995. ----- New technologies are unlocking possibilities for sustainable development. The solutions that they can generate, and the levels of access that they can enable, will be crucial to our vision for the world beyond 2015..... Large amounts of public resources are allocated to military budgets, while comparatively less is spent on research and development for public good. Public funding often subsidizes private sector research, at times leading to the public being priced out of the benefits through disadvantageous licensing and patent. A transformational and universal post-2015 Agenda is called for, buttressed by science and evidence.”*

### **3.0 UN Millennium Development Goals (MDGs) 2000-2015**

As the SDGs draws on lessons learnt from its predecessors, the MDGs, it would be well to remind ourselves of the 8 MDGs. They are as follows:

- Goal 1: Eradicate poverty and hunger
- Goal 2: Achieve universal primary education
- Goal 3: Promote gender equality and empower women
- Goal 4: Reduce child mortality
- Goal 5: Improve maternal health
- Goal 6: Combat HIV/AIDS, malaria and other diseases
- Goal 7: Ensure environmental sustainability
- Goal 8: Develop a global partnership for development

In my opinion, the MDGs are unambitious as their target is to reduce global poverty, hunger, chronic diseases etc only by half. They are also silo-like ignoring important cross cutting issues in development like increasing youth employment, developing sustainable energy, and nurturing small and medium enterprises. Finally the MDGs are government-centric without engaging the private sector and NGOs as direct stakeholders. The reason was obvious as the MDGs were promoted by G7 in the Nineteen Nineties, They mainly addressed soft development issues like education, health, gender, human right and the environment beloved of the developed world. The MDG targets were constrained by inadequate development assistance funding from the developed world with their caveat to developing countries not to expect more from the MDGs. The MDGs do not provide solutions for the urgent problem of the developing world, namely poverty eradication through gainful wealth and employment creation. Many developing countries are still off track with respect to the MDGs at the end of 2015.

#### **4.0 From the MDGs to the SDGs**

In my view, the drastic transformation from the rather unambitious and silo-like MDGs to the holistic SDGs has been brought about by the dramatic social and economic uplift since the turn of this century by South countries through infrastructure construction, domestic manufacture, industrialisation and trade and commerce.

The most striking examples have been China, the Asian Tigers of Korea, Taiwan, Hong Kong, Singapore and then, some ASEAN Countries like Malaysia and Thailand. In fact, the impressive statistics about the alleviation of poverty under the MDGs is mainly due to the achievement of China.

Most SDGs are really infrastructure SDGs. They can be included in SDG No 9: “Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.” In SDG No. 9, infrastructure is linked to industrialisation and innovation. Contrary to the widespread belief that innovation is the fruit of R&D in academia, SDG No.9 affirms that innovations that create wealth and employment happen mostly in industry throughout the world. SDG No. 9 also acknowledges that infrastructure development is the foundation for economic and social development of any country, particularly a developing country.

Propelled by China which is building mega-infrastructure throughout the world at breakneck speed and committing some US \$ 900.0 billion to such projects, I believe the alternate strategy of infrastructure based development will dominate the next fifteen years of the UN post 2015 development agenda. Indeed, infrastructure, industrialisation, manufacture and South-South cooperation through institutions like the BRICS Development Bank, Asian Infrastructure Investment Bank and regional economic communities like ASEAN, EAEC, WAEC and MERCUSUR will be the principal engines for South countries and the world to achieve the

SDGs.

## **5.0 Children and Sustainable Development: A Challenge to Education**

Coming to the theme of this workshop “Children and Sustainable Development: A Challenge to Education”, I would first like to highlight that there is no mention of “Children” in all 17 SDGs.

In the 169 targets associated with the 17 SDGs, “Children” is mentioned only 11 times in total:

### *SDG No 1 (Poverty Goal)*

- *By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions.*

### *SDG No 2 (Hunger Goal)*

- *By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round;*
- *By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons.*

### *SDG No 3 (Health Goal)*

- *By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births.*

### *SDG No 4 (Education Goal)*

- *By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and Goal-4 effective learning outcomes;*
- *By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education;*
- *By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations;*
- *Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, nonviolent, inclusive and effective learning environments for all.*

### *SDG No 5 (Gender Goal)*

- *Eliminate all harmful practices, such as child, early and forced marriage and female genital mutilation.*

### *SDG No 11 (Habitat Goal)*

- *By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons;*

### *SDG No 16 (Justice Goal)*

- *End abuse, exploitation, trafficking and all forms of violence against and torture of children.*

As mentioned before, the UN 17 SDGs and the associated 169 targets are the consensus outcome of intensive global consultation involving some 7-8 million people. Yet specific

mention of “Children” is found only in 11 of the 169 targets. It thus begs the question whether we should be advocating the importance of “Children” with respect to all the global issues associated with the SDGs in particular and sustainable development in general. “A Challenge for Education” should really be directed to all policy makers and adults in this world!

As for “Science”, it is even worse: only 3 targets out of 169 mention “Science”:

*SDG No 9 (Infrastructure and Industry Goal)*

*Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending.*

*SDG No. 12 (Production and Consumption Goal)*

*Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production.*

*SDG No 17 (Partnership Goal)*

*Fully operationalize the technology bank and science, technology and innovation capacity-building mechanism for least developed countries by 2017 and enhance the use of enabling technology, in particular information and communications technology.*

As an advocate of evidence based education, I wish there is specific quotation in any of the SDG targets of the following statement in UN Secretary-General’s synthesis report:

*“A transformational and universal post-2015 Agenda is called for, buttressed by science and evidence.”*

This would have been the vindication at the highest global political arena of Inquiry Based Science Education (IBSE) that IBSE advocates throughout the world have been tirelessly promoting for three decades.

But all is not lost. I think the following SDG No. 4 (Education Goal) target sums up what we are trying to achieve here:

*“By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture’s contribution to sustainable development.”*

## **6.0 New Challenges of Inquiry Based Science Education for All**

The SDGs 2016-2030 have the prime target of ending global poverty by 2030. As shown by the high income developing countries like China, India and those in Asia Pacific, the premise is that with economic uplift through employment and wealth creation, world peace and sustainability will be nearer to achievement by 2030. Thus SDGs are all about achieving materialistic success in this world. I used to subscribe to this premise.

However I am profoundly perturbed on the one hand by the current phenomenon of well-educated and middle class youth from the developed world joining ISIL in Syria and Iraq as jihadists. What is even more unimaginable is the willingness to sacrifice their lives as suicide

bombers! Developed world are in some fear that many will return home to perpetuate their brand of religious fundamentalism through terror in the West. Then there is also the most unnatural phenomenon of child soldiers as killing machines in Africa.

On the other hand, the developed world continues to develop high-tech weapons of destruction like the killer drone that not only assassinates its intended target but also murders innocent women and children in what the US calls “collateral damage”. Even more alarming is warfare from space like the US “Star War” strategy. The West turns her back on democracy by funding street demonstrations or funding military forces to overturn democratically elected governments in South countries. It uses NATO to bypass the UN Security Council. Europe is reaping the refugee whirlwind of the Arab Spring, Afghanistan, Iraq, Syria and Libya!

The prime challenge in education of children in the developing world is not about educating them about the SDGs or sustainable development. Most of these countries in Asia and Africa were colonies of the West with national boundaries drawn in Europe across ethnic, tribal, language and religious divides. Civil wars still erupt frequently, many fuelled by external interests especially in neighbouring countries in defence of their ethnic brothers and sisters. To me, the prime challenge of education of children and (adults for that matter) is to inculcate national unity and national pride by fusing the diverse cultures into a harmonious whole. Without national harmony and social stability, there cannot be any economic development, let alone sustainable development. This is the reason why African and other Asian countries look to Malaysia as the model of development. Malaysia is a multi-ethnic and multi-religious nation that is achieving economic and social development through understanding and harmony.

It has been proved that IBSE improves science literacy, numeral literacy and language literacy of students. As Professor Pierre Lena and Professor Yves Quere, the La Main a la Pate (LAMAP) co-founders frequently remark *“IBSE enables students to question and doubt every proposition of the so-called “prophet” unless his proposition is supported by experiment and borne out by evidence. In fact, IBSE trains good citizens.”* In the face of “prophets” of excessive military expenditure, of religious fundamentalism leading to terrorism, of profligate consumption as the model of economic development, I still believe that the only effective defence is a discerning and rational global citizenry, nurtured by evidence based education the scientific way.

But I am now convinced that merely being rational, discerning and scientific is not sufficient to solve the terrible irrational ills of the world. IBSE must add moral and spiritual underpinning to the education of children.

In Asia, our developmental success has been underpinned by the virtues inherent in our civilisation: “hard work, frugality, investment in education and care for extended family”. In Malaysia as we are on the brink of becoming a high income developed nation, we are now grappling of a new education aspiration of putting “soul” into the education of students. I look forward to this Workshop to add relevant elements of spirituality to the above.

The education of children about sustainable development and related moral and ethical issues critically depends on their mentoring in school and at home. Most school teachers are women. The greatest influence at home is the mother. My current preoccupation with respect to the SDGs is actually SDG No. 5 “Achieve gender equality and empower all women and girls”. The prime aspiration of the SDGs is to eradicate global poverty by 2030. The global poor are the women and children in the world. After centuries of discrimination, it is hard to imagine

that gender equality can be achieved by the SDG deadline of 2030. I am proposing that gender equality be made the overarching agenda of all the SDGs. The gender equality action plans of all SDGs are to be monitored through big data collation and analysis so that the strengths and weaknesses will be expeditiously highlighted to facilitate the achievement of SDG No.5. Achievement of SDG No.5 will lead to achievement of all SDGs

## **Postscript**

After the Workshop, I addressed the following letter to the Chancellor of the Pontifical Academy of Sciences:

9 December 2015

The Chancellor  
Pontifical Academy of Sciences  
The Vatican

Dear Chancellor

### **Workshop on “Children and Sustainable Development: A Challenge to Education” and Laudato Si**

I thank you and the Academy for inviting me to the Workshop on a topic that is my vocation.

I had two wishes in attending:

- To get spiritual underpinning for my vocation.
- To meet Pope Francis.

Both were not fulfilled at the Workshop.

I would like to refer to the following extract from my presentation at the Workshop “Evidence Based Education and the UN Sustainable Development Goals (SDGs) 2016-2030”:

*”The UN SDGs 2016-2030 has the prime target of ending global poverty by 2030. The premise is that with economic uplift through employment and wealth creation, world peace and sustainability will be nearer to achievement by 2030. The SDGs are all about achieving materialistic success in this world. I used to subscribe to this premise. However I am profoundly perturbed on the one hand by the current phenomenon of well-educated and middle class youth from the developed world to join ISIL in Syria and Iraq as jihadists. The developed world are in some fear that many will return home to perpetuate their brand of religious fundamentalism through terror. What is even more unimaginable is the willingness to sacrifice their lives as suicide bombers! On the other hand, the developed world continues to develop high-tech weapons of destruction like the killer drone that not only assassinates its intended target but also murders innocent women and children in what the US calls “collateral damage. The West turns her back on democracy by funding street demonstrations or military force that overturn democratically elected governments in South countries. It uses NATO to bypass the UN Security Council. Europe is reaping the refugee whirlwind of their Arab Spring, Afghanistan, Iraq, Syria and Libya!*

*The prime challenge in education of children in the developing world is not educating them about the SDGs or sustainable development. Most of these countries in Asia and Africa were colonies of the West with national boundaries drawn in Europe across ethnic, tribal, language*

*and religious divides. Civil wars still erupt frequently, many fuelled by external interests especially in neighbouring countries in defence of their ethnic brothers and sisters. To me, the prime challenge of education of children and (adults for that matter) is to inculcate national unity and national pride by fusing the diverse cultures into a harmonious whole. Without national harmony and social stability, there cannot be any economic development, let alone sustainable development.*

*It has been proved that IBSE improves science literacy, numeral literacy and language literacy of students. As Professor Pierre Lena and Professor Yves Quere, the LAMAP co-founders frequently remark "IBSE enables students to question and doubt every proposition of the so-called "prophet" unless his proposition is supported by experiment and borne out by evidence. In fact, IBSE trains good citizens." In the face of "prophets" of excessive military expenditure, of religious fundamentalism leading to terrorism, of profligate consumption as the model of economic development, I still believe that the only effective defence is a discerning and rational national, regional and global citizenry, nurtured by evidence based education the scientific way.*

*I am also convinced merely being rational, discerning and scientific is not sufficient to solve the terrible irrational ills of the world, especially the developing world. IBSE must add moral and spiritual underpinning to the education of children. In Asia, our developmental success has been underpinned by the virtues inherent in our civilisations: "hard work, frugality, investment in education and care for extended family". I look forward to this Workshop to add relevant elements of spirituality to the above earthly virtues."*

Most of the learned speakers and participants of the Workshop are eminent scientists who subscribe to the Western precept of science and its practitioners being rational. Though most of these men and women of science are also men and women of faith, they tend to hide the latter attribute in workshops involving science. I did not find much discussion on spirituality or morality in the education of children in the Workshop. It was most surprising when the Workshop opened with a minute of silence for the victims of the Paris terrorist attacks in Paris the night before! The world is confronted by young men and women of faith utilising the modern fruits of science and technology for their destructive goals like ICT and social media to spread their ideology worldwide and small weapons of massive destructive force to spread terrorism. On the side of the Workshop, we labelled them as irrational and mad beings! I think the innocent children and women under aerial bombardment from all and sundry in Iraq and Syria will also consider us irrational and mad.

Fortunately, the Workshop introduced me to Laudato Si. After reading it twice, I rally to Pope Francis' passionate call to "**Care for Our Common Home**". I appeal to men and women of science to answer his call and join his crusade as men and women of faith.

Pope Francis tweets on his Twitter account @Pontifex with some 8.0 million followers. Here are some of his most poignant tweets on the subject matters of Laudato Si:

*"I invite all to pause to think about the challenges we face regarding care for our common home. [#LaudatoSi](#)".*

*"There is an intimate relationship between the poor and the fragility of the planet. [#LaudatoSi](#)".*

*"The throwaway culture of today calls for a new lifestyle. [#LaudatoSi](#)"*

*"The climate is a common good, belonging to all and meant for all."*



*"Climate change represents one of the principal challenges facing humanity in our day.  
[#LaudatoSi](#)"*

*"The earth, our home, is beginning to look more and more like an immense pile of filth."*

*"The human environment and the natural environment deteriorate together."*

*"The deterioration of the environment and of society affect the most vulnerable people on the planet."*

*"To blame population growth, and not an extreme consumerism on the part of some, is one way of refusing to face the issues."*

*"We need only to take a frank look at the facts to see that our common home is falling into serious disrepair. [#LaudatoSi](#)"*

*"Each community has the duty to protect the earth and to ensure its fruitfulness for coming generations."*

*"Earth is essentially a shared inheritance, whose fruits are meant to benefit everyone.  
[#LaudatoSi](#)"*

*"At times more zeal is shown in protecting other species than in defending the equal dignity of human beings."*

*"We should be particularly indignant at the enormous inequalities in our midst.  
[#LaudatoSi](#)"*

*"A fragile world challenges us to devise intelligent ways of directing, developing and limiting our power."*

*"Creation" has a broader meaning than "nature"; it has to do with God's loving plan.  
[#LaudatoSi](#) "*

*"Every creature is the object of the Father's tenderness, who gives it its place in the world."*

*"Each community has the duty to protect the earth and to ensure its fruitfulness for coming generations."*

*"The present world system is certainly unsustainable from a number of points of view.  
[#LaudatoSi](#)"*

*"Whatever is fragile, like the environment, is defenceless before the interests of a deified market."*

*"Never has humanity had such power over itself, yet nothing ensures that it will be used wisely."*

*"For indigenous communities, land is not a commodity, but a gift from God, a sacred space."*

*"What kind of world do we want to leave to those who come after us, to children who are now*

growing up?"

*"Reducing greenhouse gases requires honesty, courage and responsibility. [#LaudatoSi](#)"*

*"Many things have to change course, but it is we human beings above all who need to change."*

*"Let us sing as we go. May our struggles and our concern for this planet never take away the joy of our hope."*

*[\(This article originally appeared on GlobalPost.\)](#)*

I would like to recommend for Pope Francis' consideration that his above tweets from Laudato Si be the basis for a series of short personal talks a la Sermon on the Mount to children and youth of the world in all the languages of his proficiency using the most modern mass media including social media. We must not forget fireside chats by radio which is still the main medium of communication in remote parts of the developing world.

On behalf of ISTIC, I would assure that his talks and chats will be circulated to all our stakeholders in the developing world. Hopefully with his message, the children and youth of the developing world will influence the developing world away from the profligate consumption culture of the developed world.

With Kind Regards

A handwritten signature in black ink, appearing to read 'L. ...' with a long, sweeping flourish extending to the right.