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**RIGHTS TO DEVELOPMENT AND POVERTY
REDUCTION:
CAN SCIENCE BE OF ANY HELP?**

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- **UNIVERSAL DECLARATION OF HUMAN RIGHTS**
- **“Everyone has the right to a standard of living adequate for the health and well-being of himself and his family, including food, clothing, housing, medical care, necessary social services and the right to security in the event of unemployment, sickness, disability, widowhood, old age and other lack of livelihood in circumstances beyond his control.”**

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- Having access to basic human needs is a legitimate right of every human being.
- Yet, according to World Bank sources in 1999, almost 3 billion people – almost half the world population - lived on less than 2 USD a day and 1.5 billion met Robert McNamara’s definition of absolute poverty:
- “ *a condition of life so limited by malnutrition, illiteracy, disease, squalid surroundings, high infant mortality, and low life expectancy as to be beneath any reasonable definition of human decency*”

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- Millenium Development Goals (MDGs)
- Goal 1: To eradicate extreme poverty and hunger.
- Target: To halve the proportion of people with an income of less than 1 USD per day by 2015.
- Statement by UN Secretary-General:
- *“The MDGs helped to lift more than one billion people out of poverty, to make inroads against hunger, to enable more girls to attend school than ever before and to protect our planet Yet for all the remarkable gains and progress, inequalities persist and progress has been uneven”*

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- Sustainable Development Goals (SDGs)
- Between 1990 and 2015, the proportion of undernourished people fell from 23.3% to 12.9%. Yet the number of people living in absolute poverty in 2015 was estimated at about 800 million.
- The SDGs, adopted in September 2015 with 17 goals and 169 targets, put a lot of stress on the eradication of poverty and hunger. Thus Goal 1 is “*to End Poverty in all its Forms – Everywhere*”.
- The target is to reduce by at least half the number of people living in poverty and to eradicate extreme poverty by 2030.

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- **Definition of Extreme Poverty**
- For the purpose of the SDGs, a person living on less than USD 1.25 per day is considered to be a person living in extreme poverty.
- However, what can be purchased with USD 1.25 differs from country to country.
- It is therefore more appropriate to address the causes and effects of poverty to find a sustainable solution to poverty reduction. In particular, it is important to:

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- 1. Ensure adequate nutrition for the people, which includes sufficient food production.
- 2. Tackle the problem of health.
- 3. Provide sufficient and clean potable water.
- 4. Provide appropriate and sufficient energy, including electricity, to remote villages.
- 5. Impart proper and relevant education to the poor.
- 6. Provide better communication facilities.
- 7. Minimize the adverse impacts of natural disasters.
- 8. Address the issue of climate change.

Can Science Play a Role in Poverty Reduction?



- Science is already playing a major role in poverty alleviation.
- Science can be used and is already being used to boost agricultural production, provide means to generate electricity cheaply, fight diseases and reduce child mortality, improve the quality of drinking water and promote mobile communications.
- However, there are several new avenues which can be explored.

Can Science Play a Role in Poverty Reduction?



- **Nutrition and Food Production**
- Improvement in agricultural technology, brought about by the Green Revolution in the 1960s, staved off famine and raised the income of poor farmers in Asia.
- High yielding varieties of rice and wheat helped in the fight against hunger, malnutrition and poverty.
- Biotechnology, molecular biology and genetic engineering have greatly and effectively supplement conventional breeding approaches.
- Improved rice grains have also been produced genetically to boost the supply of iron and vitamin A in the human diet.

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- Nuclear techniques for mutation breeding: Higher yield sorghum in Mali, better varieties of tef in Ethiopia and rice in Mali, crops more suited to semi-arid regions and disease-resistant crops.
- Eradication of tsetse flies in Zanzibar.
- Modern machines, improved irrigation techniques, improvement in soil fertility, new seed varieties.

Can Science Play a Role in Poverty Reduction?



- Disease Control and Poverty Alleviation
- Poverty is both a cause and a consequence of poor health.
- Tropical diseases affect almost one billion people, almost all in the poorest and most marginalised communities.
- Widespread vaccination campaigns to eradicate communicable diseases.
- Only smallpox universally eradicated.
- Considerable efforts to eradicate polio, yellow fever, malaria.
- Innovative ways to eradicate malaria: SIT?

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- Progress through production of antibiotics and advances in medical technology.
- Special attention to be given to new strains of diseases which are resistant to available antibiotics.

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- Provision of Clean Potable Water
- 660 million without access to safe water and about 2 billion without adequate sanitation.
- Poverty linked to both quantity and quality of water.
- Agricultural production in sufficient quantity dependant upon quantity of water.
- Need to identify additional potential sources of water in some regions.
- Isotopes used as tracers to study charge and recharge mechanisms of aquifers.

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- Water-borne diseases, linked to lack of access to safe water and basic sanitation, are endemic in many regions.
- Apart from commonly utilised ways to purify water, e.g. use of chlorine, specific techniques are being developed to deal with specific problems.
- Arsenic is a major source of pollution in many countries, including Bangladesh, China, India and Nepal.
- Rice University in the US employed nano-particles of magnetite which readily bind to arsenic in water and can be removed by a magnet.

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- Energy including Electricity to Remote Villages
- 1.6 billion people, $\frac{1}{4}$ of the world population, have no access to electricity. 4 out of 5 people without electricity live in rural areas of the developing world, mainly in South Asia and sub-Saharan Africa.
- Lack of electricity exacerbates poverty as it precludes most industrial activities and the jobs they create. Electric light provides extra hours for reading and work. Refrigeration allows local clinics to keep needed medicines on hand.

Can Science Play a Role in Poverty Reduction?



- In many cases, expanding the national grid to remote villages is far too expensive.
- Rural electrification has to rely on decentralised units.
- Renewable energy quite appropriate for this purpose.
- Lot of progress in recent years on efficiency and cost effectiveness of electricity generation by solar power and wind.
- Other sources of renewable energy, e.g. geothermal and the ocean, have a lot of potential.

Can Science Play a Role in Poverty Reduction?



- Science Education for the Poor
- Lack of learning opportunities is both a cause and an effect of rural poverty.
- Educating children lifts communities out of poverty.
- Exposure to basic science make students acquire skills that can make them self-reliant.
- Appropriate science education gives a better understanding of health issues, agricultural production, communication facilities, etc.

Can Science Play a Role in Poverty Reduction?



- **Better Communication for Rural Areas**
- Advent of satellite communication and mobile telephones greatly improved accessibility of information to the rural poor.
- Helps to strengthen social networks, increase ability to deal with emergencies, cut down travel costs, reduce cost of doing business, amplify efficiency of activities.
- Structured approach needed to accelerate the pace of implementation of communication facilities.

Can Science Play a Role in Poverty Reduction?



- **Minimizing the Adverse Impact of Natural Disasters**
- Natural disasters affect poorest communities more than those of higher development status.
- Science and technology help to understand the mechanisms of natural hazards of atmospheric, geological and hydrological origins to enable us to take appropriate adaptation measures.
- Scientific knowledge and technical know-how to increase earthquake-resistance and cyclone-resistance of buildings, to issue early warnings and to organise proper community response.

Can Science Play a Role in Poverty Reduction?



- The Issue of Climate Change
- Climate change is complicating efforts to reduce poverty. The biggest impact of climate change could be in food and water shortages.
- As people living in poverty lose their sources of food, fuel, shelter and income, their poverty deepens
- Science is already playing a major role with regard to both mitigation and adaptation measures to counteract the effect of climate change.

Concluding Remarks



- Science has a major role to play to reduce poverty worldwide.
- Many of the causes and effects of poverty are interlinked, e.g. water and food production, water quality and diseases.
- Necessity to have a well-structured integrated approach to use S & T to reduce poverty.
- International organisations, national governments, universities and research institutions, NGOs, and the media should all be involved in a coordinated approach worldwide.
- IAP, regional networks of science academies and national science academies are well placed to play this coordinating role.



THANK YOU FOR YOUR KIND ATTENTION