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The Challenge of Resilience in the Age of Artificial Intelligence

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Abstract:
As we utilize AI for assisting us with building more effective disaster management capabilities, we should also be aware that it is ultimately the people who utilize the technologies and it can be used for social good or to serve only vested interests—personal or institutional. While building smart infrastructures, the broader concern for building a compassionate and just society should never be lost sight of. A resilient society can only be built on the quality of its people. Data, Information and Knowledge must ultimately be guided by wisdom and higher consciousness in which there is love, empathy, compassion and inclusiveness. It is such qualities that distinguish us from machines and make us truly 'human'. Let AI revolution grow under the banner of universal love (neohumanism) and be good for both animate and inanimate entities. A course module on "History of Moral Advancement" must also accompany any academic training in AI as we explore its wider applications for establishing a resilient society.

Key words: Techno-ethics, Sustainable Communities, Resilience, Neohumanist Education

The Coming Age of Artificial Intelligence

Science has already provided the possibility of liberation for human beings from hard labor. The digital revolution and the AI is now promising to liberate us from the drudgery of repetitive chores. Artificial intelligence and machine learning capabilities are growing at an unprecedented rate. These technologies have many beneficial applications, ranging from machine translation to image analysis. Their relevance to strengthening disaster management capability is also being widely investigated (1). McKinsey Global Institute recently reported the following:

> To coordinate and prioritize emergency response, governments and first responders must have an accurate and complete view of disaster zones. Frequent and broad area satellite imagery enables new AI-based systems to quickly and accurately detect infrastructure changes that may affect evacuation and response. AI can assist in improving relief efforts and emergency preparedness with greater accuracy and on a much larger scale than human workers. Object detection software was applied to satellite imagery to detect flooded roads after Hurricane Harvey in 2017. Several AI capabilities, primarily in the categories of computer vision and natural language processing, are especially applicable to a wide range of societal challenges. These capabilities are good at recognizing patterns from the types of data they use, particularly unstructured data rich in information, such as images, video, and text, and they are particularly effective at completing classification and prediction tasks." (McKinsey Global Institute Discussion paper—December 2018, AI for Social Good)

Augmented Intelligence, now popularly called, Artificial Intelligence is here to stay. An Indian philosopher and sage, Shrii Shrii Anandamurtiiji expressed it very eloquently as early as 1959:"What the cosmic mind is doing today in a tangible manner will continue to be done by unit-minds on this earth in gradual steps".

There are also, however, serious concerns about potential misuse of AI. The workshop conducted jointly by several institutions on "the malicious use of AI" was held at Oxford in UK in 2017 and its report focused on identifying threats and ways of prevention and mitigation. "Some concerns are directly related to the way algorithms and the data used to train them may introduce new biases or perpetuate and institutionalize existing social and procedural biases. For example, facial recognition models trained on a population of faces corresponding to the demographics of artificial intelligence developers may not reflect the broader population. Data privacy and use of personal information are also critical issues to address if AI is to realize its potential. Europe has led the way in this area with the General Data Protection Regulation (GDPR), which introduced more stringent consent requirements for data collection, gives users the right to be forgotten and the right to object, and strengthens supervision of organizations that gather, control, and process data, with significant fines for failures to comply. Cybersecurity and 'deep fakes' that could manipulate election results or perpetrate large-scale fraud are also a concern."(2) Realizing the gravity of potential misuse a center for data ethics and innovation" has been established in UK as a non-governmental organisation.

Technology is only as good as the people who employ it and the purposes they use it for. Recognizing the potential of harm that can be caused by any self-centered person, there is a call for AI Codes, AI Regulators and Ethical Framework to deal with issues of safety, fairness, transparency and collective good from the very outset. The questions being raised are:

1. Does the data reflect the population? Algorithmic bias, racial bias, gender bias, background bias etc.; lack of diversity in data sets; lack of diversity in modeling; lack of diversity of mind-sets—these are all matters of concern. Who should be the custodian of all data —private corporations or some public authority?
2. Even if data reflects the population accurately, does it mean that we should continue to treat it for perpetuity? What is fair?
3. Are there some things that AI and related technologies can do which we should never do? What is the ethical framework guiding humans and these technologies? Can AI build-in incentives that may lead policy makers or administrators to make wrong decisions?
4. Can the AI tamper with the democratic institutions and ultimately erode the freedom of individuals in the society? What are the standards to which AI should be made accountable? What systems are in place to ensure the safety of critical data related to infrastructures and other sensitive domains?
5. Who should be made accountable for the 'invisible' complex networks of AI that would underlie the systems being employed by decision makers of different institutions? How to attach responsibility to humans for the use of data or AI or related technologies?
6. In the task of rebuilding disasters areas, what is the role of 'culture'? In building smart cities—what about people? How AI can be used to preserve local history and local cultures?

This paper raises the following important questions:

1. Will AI become a successful tool of empowerment rather than exacerbating disparities? What are some other simmering techno-ethical issues related to AI?
2. How to face the challenge of economic renaissance in the age of AI?
3. How to move towards a resilient society & strengthen disaster management capabilities?

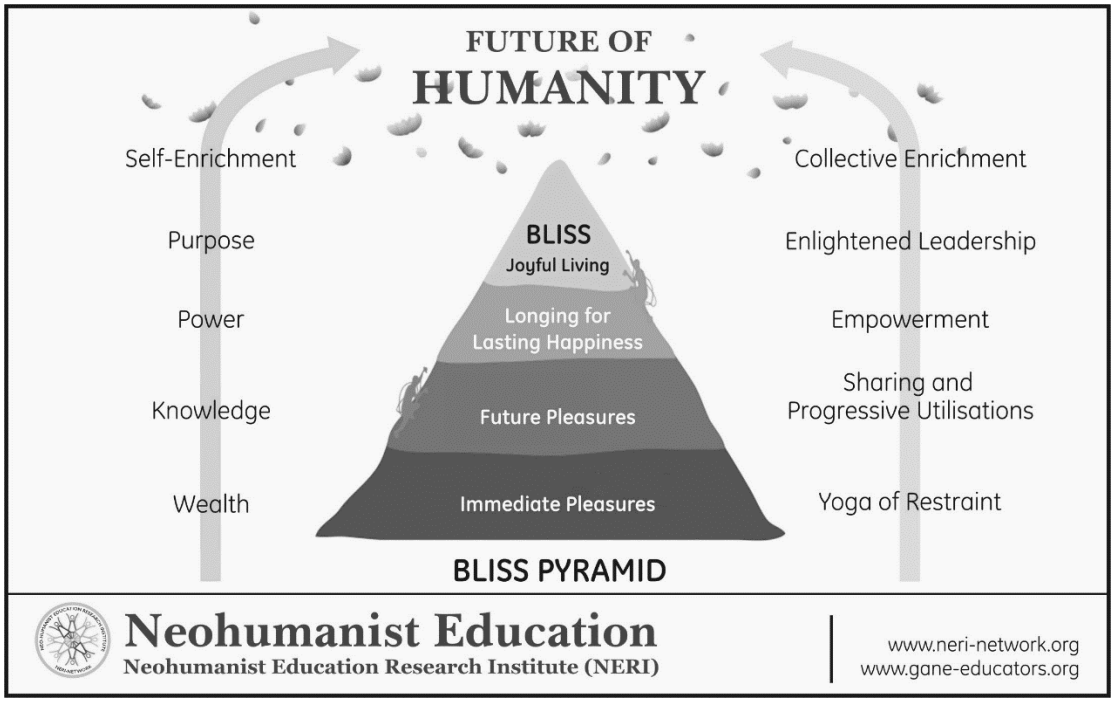
DISASTER PREPAREDNESS AND RESILIENCE

Disasters or calamities, in a cosmological sense, are the result of inherent propensity of macro-cosmic forces to bring back the eternal equipoise in all strata of existence. Neohumanism is a philosophical response to incorporate the principles of balance in all domains of human existence. Disasters are usually ruthless and indiscriminately sap the vitality of a society. Hence, disaster preparedness calls for establishing ground initiatives for enhancing resilience capability of each and every community. Communities need caring support systems as well as survival and coping skills to handle emergencies resulting from disaster of any kind. Vulnerable groups like old people, children, flora and fauna and persons with disabilities are the greatest victims of a disaster that require extra attention. Disaster preparedness or survival skills training should, however, begin from an early age. Hence, the need for linking disaster preparedness with youth programs and creating volunteer disaster relief teams led and empowered by youths in every village, city or town. Besides, can we build 'smart' infrastructure without 'smart' people? We also need to pay attention towards improving capabilities of ordinary citizens to serve as 'wise and smart' people. Neohumanist Education is a response to this need. Furthermore, how to preserve our local cultures while designing sustainable cities after disasters?

Besides the material challenge to deal with survival issues of disaster victims, there are long-term developmental aspirations that need fulfillment. The goal of disaster management capability, therefore, is to ensure quickest responses towards survival, growth and sustainability. In this task, technological assistance can go a long way to convert disasters into opportunities for resilient, sustainable growth. The development communities can only welcome AI as a tool for achieving the targets of millennium development goals (MDGs). Technologies are only as good as those who employ them. AI **(**Artificial or Augmented Intelligence) should be seen only a support and not a substitute for NI (Natural or Native Intelligence).

Resilience is the stamina or ability of an organism to cope with and recover from shocks, calamities or disasters or unfavorable conditions; to flourish and grow despite all odds and limitations; and, to attain a state of collective flourishing. In development theory, resilience refers to the centripetal quality built into the policies, institutions and governance in order to counteract any structural vulnerability — local, regional, national or global. Resilience is intimately connected with both disaster preparedness as well as development strategy. One of the areas of disaster research is also to look for opportunities and ways to correct the wrongs or existing imbalances that compound the impact of disasters. In this endeavor, the notion of Prama may also be helpful in order to identify and correct the gross disparities and foster resilience in our society.

The French economist Thomas Piketty and USA Professor Ravi Batra have presented overwhelming evidence that accumulated wealth has typically grown at a rate that outpaces increases in workers' wages all over the world. The result, they argue, is an ever-widening gap between the extremely rich and everyone else. The use of advanced technologies lies at the core of these widening gaps (3,4). Would AI further exacerbate these gaps? The solution may lie in first understanding the dynamics of biopsychology that breed such imbalances. The moral choice of adopting the path for the future will determine the end result.



If AI can assist and serve to reveal all disparities and help build a world of balance, of equipoise, of resilience, of sustainability, it would indeed be a day of celebration for the entire humanity. On the other hand, if economic inequalities continue to persist and increase, AI could aid the process of translating these economic disparities into biological inequalities thereby threatening the very existence and worth of ordinary humans. Hence, ongoing research on technological impact assessment is needed and should be welcomed.

PRAMA—THE PATH OF RESILIENCE

Prama is a Sanskrit word meaning well-proportioned effort, a proper measure, balance, harmony, dynamic equilibrium and dynamic equipoise. The theory of Prama (5), as the guiding principle of a society, was first introduced by an Indian sage and philosopher Shri P.R. Sarkar in 1987 in order to address the diverse problems of human society emanating from the inherent vulnerabilities in any system and strengthen resilience. Search for a proper path of progress in the midst of conflict-ridden situations is the crying need of our times. In Shrii Sarkar's view, "the primordial natural state of dynamic equilibrium and equipoise of the Transcendental Entity is called *Prama-trikona* whose nucleus is *Purus'ottama*–Supreme Consciousness." Disasters are reminders to us to correct all imbalances that have crept in different spheres of our life.

LOSS OF 'PRAMA' IN SOCIETY

When the society loses prama (loosely translated as balance), chaos begins to set in. In the ultimate stage, the society ends up in the most degenerated doldrums stage. Society becomes directionless, without proper vision and without even a proper approach of action. This is the state of total blindness. The result could be total annihilation of civilization and culture. Mass destruction becomes commonplace. Nation-states reach the brink of bankruptcy. Conflicts increase, leading to widespread suffering of innocent citizens. Disparities abound and the purchasing power of common people declines to below poverty level. Such a state of affairs exposes the total lack of 'prama'. There is then dearth of structural balance (equipoise) as well as utter lack of dynamic equilibrium. At its climax, such situations give rise to mass discontent and even cause revolutions. Lack of prama in personal life brings physical diseases, psychic complexes and spiritual vacuum. The lack of prama in social life is the cause of physical

disparities, dogma, and exploitative and imperialistic tendencies in the collective psyche, and spiritual bankruptcy.

RESTORING PRAMA

In every sphere of life, there exists the expression of the threefold forces of nature: sentient (*sattva*), mutative (*rajah*) and static (*tamah*). The interplay of these forces is symbolized through the triangular representations called "Trikonas". Physical *prama-trikona* refers to the balance of physical expressions. The attainment of *prama* in the physical sphere is called ***Prama-Samvriddhi.*** Material prosperity of one and all is the natural outcome of *Prama-Samvriddhi.* Psychic prama-trikona refers to the balance in the psychic expressions. The attainment of prama in the psychic sphere is called ***Prama-Riddhi***. The spiritual prama-trikona refers to the balance of forces in the spiritual stratum, its attainment being termed as ***Prama-Siddhi***. The culminating resultant balance among physical, psychic and spiritual attainments is the eternal loka-trikona. The status of loka-trikona comes close to the primordial force of creation and is a pinnacled macro-cosmic stance of combined social-expressions. In loka – trikona, the three sides of the cosmic triangle are represented by *prama-samvriddhi, prama-riddhi* and *prama-siddhi.* In his magnum opus *Ananda Sutram (6)*, Shrii Sarkar reveals the origins of endless gun'a trikonas comprised of *sattva*, *rajah* and *tamah* attributes of the cosmic operative principle.

Sutra 4.1 " Trigun'a a'tmika' srs't'i ma'trika' ashes'a trikon'a dha'ra' "

[The tri-attributional primordial force (progenitrix of creation) flows on in endless triangular forms.]

All of creation is the result of three binding forces acting on the cosmic body of Supreme Consciousness in order to create endless mutual transformations through the process called homogenesis or homomorphic evolution. In the process of constant metamorphosis, a stage comes when due to the relative pressures of gun'as, the balance of cosmic triangle of forces is lost and creation ensues through one of the vertices as *ichhabiija* or *ka'mabiija*. That starting point is termed as *Shambhuliunga* followed by *jinanashakti na'da* (vibrational flow without curvature) and *kala'-prava'h* (with curvatures) in a sequential flow. The psychic and physical worlds are created until the creation reaches a nadir called *Svyambhuliunga*. The cosmic force lying quiescent around *Svyambhuliunga* is called *Kula-Kund'alinii* (*jiivabha'va*) and is the source of stamina and microcosmic power. The resilience of a group of people is intimately connected with the awakening of this dormant power lying within us. The endeavor to revert to a balanced prama-trikon'a and consequent **resilience lies in building systems that are friendly to all beings- animate and inanimate** (7). Recognizing the role of microvita (smallest subatomic vital structures) and the self-controlling faculties in creation is the first step towards achieving equilibrium and equipoise in all strata of existence. Artificial Intelligence (AI), though a powerful tool, cannot be placed above the Natural Intelligence (NI) that is endowed to every living being.

The path of resilience based on prama is the shortest critical path to achieve better disasters-management capability as well as to attain the goal of sustainable development—thereby ensuring optimum utilization of resources while providing economic justice to the natural environment, future generations, vulnerable groups and all beings in general. This following section explores how we can bring about a resilient society based on this principle of seeking balance.

SURVIVAL (ASTI)—THE FIRST STEP TOWARDS RESILIENCE

The three facets of resilience of a society are: Survival (*Asti*), Growth/Development (*Bhati*) and Anandam—the progressive goal that encourages forward accelerated movement (*Dyut-Gati*). The three primary elements of pursuing the goal of ensuring minimum requirements and maximum amenities and consequent resilience in the mundane sphere, for instance, are

i) Continuous Assessment of Community Needs
ii) Commensurate Increase in Purchasing Power
iii) Availability of Goods and Services

AI can assist us to respond more accurately in order to bring about equipoise of these three areas of physical-prama. Academic institutions could show leadership in showing the use of block chains, IoT, Cloud database and developing AI applications to create an accurate inventory of needs, availability of goods and services and commensurate purchasing power.

The task of a proper socio-economic system is to create conditions where there is maximum utilization of all resources, rational distribution of wealth, and where the utilizations are of progressive nature. Shrii P R Sarkar envisioned such a socio-economic system as early as 1959. In the words of Professor Sohail Inayatullah, "The vision of **Pro**gressive **U**tilization **T**heory (**PROUT**) takes us beyond the dominant economic ideologies of capitalism and communism. Shrii Sarkar imagined a world with far greater efficiency, far greater productivity, far less inequality, living with nature and enhanced by amazing new technologies—"mind in technology", if you will—what we know today as the beginning of artificial intelligence (AI). This would be a planetary civilization where the boundaries would be functional not sentiment based as in today's nation-states. In this vision, contradictions do not magically disappear; however, exploitation decreases and the world gets better and better"(8). It would encourage achieving regional self-reliance through a policy of economic decentralization, integrated farming as opposed to mono-cultures, use of renewable energy and green technologies, healthy collaboration of public and private sectors, strong national security apparatus, stable and robust political leadership systems, integrated policy making, deliberate

foresight planning, risk assessment & horizon scanning, clearly defined national goals, multiple streams of learning, while embracing psycho-social factors such as patriotism, justice, social identity, belonging and a sense of cosmic kinship.

Disasters can also be seen as opportunities provided by Nature to correct the lacunas of the past, remove the prevailing imbalances and achieve the goal of sustainability in post disaster phase. Developmental aspect of post-disaster management needs to be integrated with progressive developmental strategy of each area in order to ensure equitable growth and sustainability while removing the disparities and preserving the diversities. There is a need to constantly scout, locally and globally, for the most economical and sustainably progressive viable alternatives and make such options and information accessible for all needy parties.

The need for speed in post-disaster response also raises a set of issues of how best to utilize technological connectivity coupled with spirit of service in order to serve vulnerable groups especially children who are greatly traumatized after the disasters. Just as establishing fire brigades in a city is necessary to fight local fires, similarly support systems need to be built in every community to actively respond to all types of calamities. New communications technologies offer opportunities to create, strengthen, and maintain real-world ties and enable rapid response to emergencies. Technology, if used benevolently, certainly has the power to strengthen the proximate community. Technology alone, however, cannot deliver a balanced and resilient society unless the human beings chose to act responsibly for collective good.

Advancements in technology must be balanced with enlightened leadership and an increase in compassion, magnanimity and wisdom among all citizens. Community-led disaster response centers linked with government support programs in every village, city or town to ensure that help will be readily available in any emergency situation as amply proved by AMURT (www.amurt.net) and similar NGO's.

The idea that resilience can be engineered and measured through technologies and methodologies in areas such as risk management, disaster management, forecasting, surveillance, biosciences, adaptive resource management and health sciences continues to dominate most approaches to resilience (9). Some current examples include development of genetically engineered drought resistant crops; new water harvesting structures to overcome irregular rainfall and depleted water tables; improvements in national security and surveillance systems to thwart terrorist attacks, social unrest and crime; re-engineering of flood defenses, transport systems and buildings to withstand the effects of climate change; pre-assessment of health and other risks associated with adopting new technologies. It is now being increasingly recognized that psycho-socio-spiritual factors are equally important to successfully adapt and organize communities of people in a constantly changing and competitive global economic and ecological environment, for the sake of survival and prosperity. Any sustainable approach must be based on economic justice to the environment, needs of future generations, needs of all species, and especially all vulnerable groups. Advances in technology must be balanced with increases in compassion, magnanimity and wisdom among all citizens.

ALLROUND DEVELOPMENT (BHATI)

The development of a resilient society requires more than just mere application of technology for material ends. The moral and spiritual fiber of the nation also needs equal attention. While it may be easier to establish physical equipoise in the mundane sphere as some western nations claim to have achieved, it is more difficult to achieve mental equanimity. It is no surprise therefore that yoga and meditation have become household words in response to a compelling need to deal with the menace of 'stress' in the modern world. Thus, a proper socio-economic

theory, neohumanist values, a spirit of service, cooperative mentality and survival skills contribute greatly to enhancing the resilience capability of a community. The endeavor to create a **GLOBAL NEOHUMANIST VISION** * can also inspire the younger generation to envision a world free from self-centered worldviews and myopic visions of the future.

*** THE GLOBAL NEOHUMANIST VISION**

[envisioning resilient sustainable local communities]

where there is freedom,without fears; and,
a constant endeavor for harmony among all species;

where good health of all is the norm; and
there is local sustenance: free from scarcities, poverty & disparities
and, where purchasing power of all keeps improving;
where conflicts are resolved through dialogues
and challenges are faced with optimism and courage;

where the uniqueness and diversities are celebrated;
and, where ethics is the foundation of personal & social life;
where science & technology are dedicated to greater welfare
where higher-consciousness guides all forms of biological & AI;

where religion & spirituality affirm cosmic kinship and rationality;
where creativity, imagination, fine arts are for service and blessedness;
and, where compassion, humor, joy & universal love pervade & reign!

And, where deep-education (NHE)* inculcates and nurtures "deeper understandings, cardinal values, innovations and leadership"; Relief Teams lend a ready helping hand in disasters; and The Renaissance Movement & PROUT** offer a new paradigm for self-sufficiency and economics of abundance and coordinated cooperation.

*Neohumanist Education (NHE) ** Progressive Utilization Theory (PROUT)

ROLE OF INTUITIONAL PRACTICES AND THE GOAL OF ANANDAM

Human beings came on this earth a million years ago and started a civilization about 15000 years ago. We have still not successfully achieved a perfect balance in all spheres of human endeavor. This is due to a lack of psychic and spiritual *prama trikon'a*. The presence of dogma and superstition has kept human intellect locked in senseless egoism. In the words of Dr. Marcus Bussey, "Transformative harmony as an expression of *Prama* is not the end of tension but its benevolent expression. It is the pragmatic quest for balance between the two polarities of culture, one that is more inward looking and centralized and the other that is more resilient and receptive to learning. Harmony without dynamism is statis. Harmony as an element of social process is a normative goal that calls for social actors to reflect on their actions and their effects on the world around them."(10)

The benevolent lustre of cosmic kinship and universal love will be able to express the grandeur of spiritual *prama trikon'a* when there is a sweet blending of knowledge (*jinana*), action (*karma*) and devotion (*bhakti*). The endeavor to create a global neohumanist charter* can also inspire the younger generation to envision a world free from self-centered worldviews and myopic visions of the future and to establish our world in *Prama-Siddhi.*

I would remiss if I failed to point out that traditional community practice of chanting kiirtans in India have long been believed to be a disaster-mitigating activity. Its importance should not be slighted, as declared by Shrii Caetanya Mahaprabhu and other spiritual masters.

> "The physical afflictions of this material world are caused partly by nature, and partly by human beings themselves. Now, whatever might be the physical miseries – be they natural or man-made – if people collectively chant *kiirtana*, the calamities are dispelled. In case of natural calamities like flood, famine, drought or epidemic, or man-made calamities, miseries and tortures - if *kiirtana* is chanted with maximum sincerity, it will bring direct relief in no time. In addition, *kiirtana* removes the collective psychic afflictions as well - those which are already existing, and those which have not yet arrived but about which we have premonitions of their impending arrival. If *kiirtana* is done in advance, those impending troubles disappear. Why do they disappear? They are dispelled not merely because of the collective mental force of so many people, but also due to the impact of so many minds moving with tremendous speed under the inspiration of *Parama Puruśa*. At the place of *kiirtana*, not only the people who are themselves doing *kiirtana* will be benefited, but also those who are not participating – and even those who are not participating and who do not even like it – they will also be benefited! Those who listen sincerely to the chanting of *kiirtana* will be benefited and those who do not listen sincerely but simply hear inadvertently without any respect, they too will be benefited. (Shrii Shrii Anandamurtii, 1982, Kolkata)

CONCLUSION—A CALL FOR MORAL ADVANCEMENT

In summary, the path of resilience is a constant endeavor to build a world of balance in all strata of existence. Climate change resulting from solar activity, stratospheric ozone depletion, atmospheric aerosol loading, ocean acidification, biochemical flows, fresh water use, land-system change and biosphere integrity are some of the variables that need monitoring on a global scale in order to ensure maintenance of the Earth System (ES) in a resilient and accommodating state (11). AI and Satellite Imagery together can help us become more alert or aware of the impending crises before they actually strike and should be maximally utilized to assess the vulnerable groups and risks involved in each case.

The ability to cope with any crisis also requires psychological/spiritual preparation and skills development. The responsibility to respond to the crises must also include the welfare of plants, animals and other life forms and even so-called inanimate things. For instance, it is being recognized that extensive use of pesticides have infiltrated into the underground water system in Punjab and could be the primary cause of cancer in the human population. Thus, the ongoing impact of technologies being employed and the assessment of risks to environment and life forms need to be continuously reassessed.

In the face of mass automation and artificial intelligence, the impending threat/promise is that we will all become productively superfluous. AI can never be a substitute for human intelligence, creative expressions, supporting relationships and wisdom. AI, some warn, could lead ordinary humans towards "new addictions, apathy, indolence and boredom". As we embark on using AI and related technologies in greater measure, we cannot lose sight of the equal need for moral development of citizens in every community and exemplary models of leadership at every level of society- from home to nations.

Technoethics (12) as a living discipline must accompany all technological and scientific research. The issues of privacy, dignity, equity, diversity, disparities, health, safety, fairness, transparency, collective welfare, inner peace, moral advancement and elevation of human consciousness become increasingly important in the digital age of ICT (Information and Communication Technologies), AI (Artificial Intelligence) and ML (Machine Learning). Age-appropriate course modules on " The History of Moral Advancement" could thus be developed and introduced as a mandatory subject in curricula of all technical institutions. AI cannot be seen as a panacea without continuous efforts towards upgrading moral standards and elevating human consciousness.

Echoing the thoughts of Albert Einstein, “we are concerned not merely with the technical problem of securing and maintaining outer peace. We also need inner peace and so we should also be concerned with the important tasks of education and enlightenment. When the ideas of humanity are war and conquest, these tools become dangerous. The fate of humanity is entirely dependent upon its moral development.”(13) AI as a tool of mass-surveillance and autonomous weapons has its scary side but as a tool to help actualize millennium development goals and build efficient disaster management capabilities, it is indeed a boon. Technologies become a curse or a boon depending on the degree of ethical responsibility employed in their use.

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