Shifting Human Development Paradigm and blending SDGs during the transition

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Title: Shifting Human Development Paradigm and blending SDGs during the transition.

Introduction

This document is prepared without having any intention to downgrade present values and norms of ourselves live today experiencing the present technological advancement and the beauty of the planet. In other words, article has no any bias towards any religion, philosophical thinking or any doctrine and written to explore the possibility of blending SDGs during the paradigm shifting process.

Since the early stages of human development we have achieved unbelievable wonders in all sectors of development spending renewable and nonrenewable natural resources. We are now capable of exploiting these resources with latest technological advancements and nature is trying to gain the lost ecological resilience in many ways. Hence, we experience the global environmental catastrophe. Evolving and awakening human conscious become aware of the mismatch of the way we use goods and services provided by the natural ecosystems and struggling to find ways and means to reestablish a better negotiation with the nature. With this background we understand that human development modal could be more sustainable if we consider the social and environmental aspects. Chemistry of sustainability is mainly depending on eco conscious technological approaches and a human society with advanced spiritual achievements to avoid the today's consumerism. Over consumption of starchy, salty and sweaty fast foods may lead to unhealthy livelihoods and ecosystems.

Presently, we humans use more than forty percent of the total global land availability to increase primary production. More than sixty percent of the global population is under the poverty line and we expect doubling the population in the middle of the century. In order to cater to this burning issues, we need to improve the land productivity as well as the livelihood of the people. As we discussed earlier, we must avoid the individual or family level destruction and collective destruction we practicing today for our existence.

Therefore, paradigm shift must address these main destructive forces. This concept paper discusses several approaches to find a pathway to shift the existing human development model in to a more sustainable and eco conscious paradigm.

Philosophical mismatch

First let us look at the human philosophical thinking process and its development. Philosophy has developed to explain things experienced by man with respect to the nature surrounded by him. Basically, it could be categorized in to two major streams namely, god given philosophy and manmade philosophy. God given philosophy explains, ways and means of living harmony with the nature. Manmade philosophy further could be categorized in to another two sub categories. First category was developed to explain things that are unexplainable to him. Most of the religious thinking comes under this category. Second category was developed to explain ways and means of sharing natural resources with other colleges. Most of the political theories and philosophies comes under this category. Today we are gradually realizing that manmade philosophical thinking has its own shortcomings and derived present environmental crisis. Even religious misinterpretations aggravate battles among different religious groups.

God given philosophy

Hinduism

God has created everything and he himself given ways and means to live meaningfully and happily within this world and pathway to reach him at the end of the life. If we do not obey him, has given the consequences also.

Example: “Do not cut trees, because they remove pollution.” (Rig Veda, 6:48:17), “Do not disturb the sky and do not pollute the atmosphere.” (Yajur Veda,5:43), Destruction of forests is taken as destruction of the state, and reforestation an act of rebuilding the state and advancing its welfare. Protection of animals is considered a sacred duty. (Charak Sanhita)

Cretinism

God has created everything and he himself given ways and means to live meaningfully and happily within this world and pathway to reach him at the end of the life. If we do not obey him, has given the consequences also.

Example: Psalm 96:10-13. The Lord reigns... Let the heavens rejoice, let the earth be glad, let the seas resound and all that is in it; let the fields be jubilant, and everything in them. Then all the trees of the forest will sing for joy, they will sing before the Lord for He comes, He comes to judge the earth. Isaiah 43:20-21. The wild animals honor me, the jackals and the owls, because I provide water in the desert and streams in the wasteland, to give drink to my people, my chosen.

Islamism

God has created everything and he himself given ways and means to live meaningfully and happily within this world and pathway to reach him at the end of the life. If we do not obey him, has given the consequences also.

Example: The Qur’an also recognizes that people take pleasure in experiencing variety, particularly in their food, while again, warning against being wasteful: It is He Who has brought into being gardens, the cultivated and the wild, and date-palms, and fields with produce of all kinds, and olives and pomegranates, similar (in kind) and variegated. Eat of their fruit in season, but give (the poor) their due on harvest day. And do not waste, for God does not love the wasteful. (6:141)

God given and Manmade religions

Hinduism, Cretinism and Islamism have god given philosophical thinking. Buddhism, Jainism, Taoism, etc. are manmade religions. Except Buddhism, other religions explain how to live harmony with the environment and achieve higher spiritual states other than Nirvana.

Endless suffering

God has asked to live as what he said and come to him where you can get the eternal life. What I feel about this eternal life is that if there is any life form in that eternal state, that should not be made up of body like ours or materials like ours. Because, we are getting older day by day, and with time getting sick and our body confirmation is degenerating where god has not given any solution to this problem.

Buddhism and man

Buddhism is a manmade philosophy where Load Buddha has born as a man. He has developed his own path to somewhere identify him as Nirvana where anybody could achieve it by Skanda Prarinirvana. In this situation man can get rid of any form of physical body after death. Then you will be able to eliminate all kind of sufferings due to degeneration of physical body and fluctuations of mental status. Furthermore, he has explained the way of living harmony with the environment.

Example: In Karaniya metta sutra, Buddha has preached to extend our compassion to all living beings both born and unborn. It is as follows. “Whatever breathing creatures here may be, no matter whether they are frail or firm, or middle-sized, or be they short or small, or whether they are dwelling far or near, Existing or yet seeking exist, May beings all be of a blissful heart. "

Curiosity and ego of the man

In early days of his evolution, man might have started to worship lightning, thunder, large trees, and rocks due to, huge light and sound they experienced and mightiness of trees and rocks they observe. Later they may have started to worship those as supper natural phenomena and used to pray for relief from their sufferings. But after inventing the fire and some primary tools, belief systems may have changed. With these new capabilities humans tried to question about god given philosophy by developing their own philosophical thinking to facilitate the application of new technologies to negotiate with the nature and natural resources. This may be the basis for the manmade philosophy.

Manmade Philosophy

As I discussed earlier human philosophical thinking could be categorized in to two sub streams. Philosophical thinking to explain which are unexplainable to him and philosophical thinking to explain ways and means of sharing natural resources with other colleges.

Doctrines developed to explain things that are unexplainable

With the advancement of the technological knowhow and thinking patterns, man wanted to define god, to recognize him, and to see him. Earlier he worships trees and rocks but now he needs to cut and flatten rocks and mountains for his own livelihood development. He did not experience the environmental consequences of their actions immediately. Later he wanted to define god having similar body conformation like him but with some super natural forces and features and religious philosophies were developed based on these wants and needs. Later, to understand these unexplainable concepts and his own creations, developed a philosophical thinking named as Metaphysical thinking.

Further to this he wanted to have groups, may be his family, close friends etc. and later to fight as groups to get more natural resources to his own group as a group leader. This could be the reason to define many gods with weapons and later they may have developed worship methods and ethical belief systems to seek help from their goads, to conquer their own colleges. Based on these definitions and experiences he was able to rewrite the philosophy which was given by god to him. These rewritten doctrines allowed him to kill his own colleges to protect his own belief systems and to gather more natural resources for his own group.

Doctrines developed to sharing natural resources with other colleges

From group work to, slavery, to imperialism, to capitalism to communism to socialism to democracy, man has developed various philosophical thinking to share resources and manage it sustainably. In order to support these different sharing systems humans were able to develop epistemological thinking to study about vast knowledge gathered by his own colleges form various parts of the world. These epistemological thinking was helped him to share knowledge and experiences with different communities.

Furthermore, he developed the axiological thinking to explain the way and means of sharing resources among the different communities as well as within the community and identified as politics. Later political ethics were developed to be followed by local and international governing bodies.

According to the god given philosophy, life is created on this planet. Basically, humans were not satisfied with this creation, and theory of evolution was developed to explain how life was evolved in this planet. But he is still trying to figure out what is reality behind this and investigating whether life has arrived from outer space and trying to communicate with outer space to find any other life forms.

Even though, humans defined various habitats of other living beings, still unable to define habitat of his own with different scientific doctrines developed so far. Further to that, various development programs, projects and strategies formulated based on these philosophies and doctrines experience catastrophic consequences.

Catastrophe

Basically, humans were able to increase the life span and was able to live more comfortably and healthy compared to early development stages. After conquering the outer space, humans came to know that it is mightier than he thought and invented a space ship capable of traveling greater than the speed of light. In future he will develop space ships to travel outer space with this speed and another technological revolution will experience by him.

With all these technological advancements and the knowledge in hand, he is now experiencing the consequences of the so called scientific development. Nature is trying to regain balance which was lost due to anthropogenic activities. Humans identify these consequence as a crisis and trying to figure out solutions. Day by day humans are realizing that manmade philosophies and doctrines have no solution even to support this natural rebalancing process. As an example sea level rise is understood as a consequences of climate change, but we forgot to quantify the increased overland flow and depleted groundwater table due to increased imperviousness with the infrastructural development like, buildings and roads.

Catastrophic consequences of the existing Human development model

Basically, the way of utilizing land and water resources to improve livelihoods are creating irreversible environmental damages and consumerism based on mono-cropping and fast foods create, loss of biodiversity and increment of non-communicable diseases.

Human habitat and its environmental incompatibilities

I would like to first discuss about the human habitat and how we use it today. We have started so called development in early stages of human civilization as a set of activities at micro scale. Now development is at macro scale and impacts are also at the same scale. Human habitat or settlement schemes are in many forms and used for residential, commercial and industrial purposes with huge infrastructural development comprised of buildings and paved roads with drainage lines. Buildings and paved roads, created impervious crust over the planet surface and blocks infiltration. This will increase the overland flow and deplete the groundwater reserves, perhaps the main reason for the sea level rise.

Cultivation has changed from diverse cropping patterns to mono cropping, resulting drastic loss of biodiversity, increased and over use of agro chemicals, unexpected pest resurgences etc. leading to crop loss, soil, water and air pollution. Due to these incompatibilities, various forms of environmental destructions could be observed namely, individual and collective destructions.

Individual and collective destruction procedures adopted for the human production process

Humans have not been able to clearly define limits of their habitats yet. Simply it can be defined as places where we live and several limitations were defined to protect natural environmental resources

namely, buffer zones, restricted areas etc. Due to mismatch of the boundaries defined by humans with the natural boundaries, most of the development approaches experience devastating impacts.

Individual destruction process

This could be one of the ridicules things one could observed in this beautiful planet. Humans clear the natural forest cover and build permanent control structures to keep away from the nature and grow inedible, invasive plant species considering only the beauty of it within the vicinity and we call it as landscaping in homes and gardens. This could be identified as individual or family level destruction of the nature and the natural biodiversity and reduction of natural agnatical pool

Collective destruction

Humans allow somebody else to produce food for them and they buy foods from those producers. Producers use heavy machinery and agro chemicals to practice mono cropping and increase the carbon foot print. They ignore the consequence of having mono cropping and the destruction of bio diversity. This could be identified as the collective destruction performed by a one living being for their existence compared to other living beings.

Agriculture and its consequences

Soil is disturbed seasonally and it is not allowed to form naturally. Soil is no longer a living being, need to add fertilizer to get the desired so called economical yield. Varietal selection and acclimatization leads to a situation where plants lost their natural vigor, genetic variability and cannot survive without chemical fertilizers. Man use chemicals to control other living beings identified as pests. Due to that, increment of population density of some other species fill the biological vacuum and we identify this phenomenon as pest resurgence. Finally, all these set of activities collectively identified as the modern AGRICULTUR.

Agro chemicals pollute surface and ground water resources and consequences are identified as burning issues of the ENVIRONMENTAL catastrophe. Humans clear natural forests in highlands to build settlements or habitats and agricultural purposes and complain about CLIMATE CHANGE, diminishing of water resources and pollution of ground water.

Research and Development

Based on the technological advancements and philosophical thinking processes, humans started to work based on his own experiences without considering what god has been asked from him to practice for his own survival and to support other living beings. In order to understand, forecast, predict and disseminate his own technological and scientific advancements, developed scientific methods and statistical evaluation procedures.

These methods and procedures helped him to understand and explain natural phenomena happening around him and identified as RESEARCH AND DEVELOPMENT. Humans justify their results using statistical procedures by identifying unexplainable natural variation (under rich bio diversity) as experimental errors or outliers and they minimize this error by ignoring the natural variability using statistical models. They develop confidence intervals and justify their results and ignore the impacts of outliers as experimental errors. Humans do not want to study the behaviors of these experimental errors and forgot and go ahead with their results with limited accuracies. All these scientific approaches have created a huge gap between natural reality and the technological advancement and experiencing the global ecological catastrophe where planet is losing the natural genetic variability, bio diversity, depleting groundwater resources, increasing sea levels etc.

Humans develop equipment to measure air quality but are unable to measure the medicinal properties added by the plants to the air and how they get natural medicinal breathing, but they practice Yoga breathing without even looking at what ancient Gurus or “Rishies” told them to not to do and how to live harmony with the nature. Similarly, humans have equipment to measure water quality and still they do not know what medicinal properties are added by roots of thousands of plant species to water in streams in virgin forests. They bottle this water and sell as mineral water and clear forests in up streams, forgetting the medicinal values added by flora.

Food production and consequences

Food becomes an industry. Since everybody need foods producers get the support of scientists to increase the food production and scientists develop new high yielding verities by using various genetic engineering technologies namely, varietal selection, breeding etc., and they alter and narrow down the natural genetic variability of natural eco systems. Hence, humans lose natural nutrient profile freely available from the places they live and buy vitamin supplements. Humans consume more calories than required and experience non communicable diseases as a natural gift and go for synthetic medical treatments with side effects.

Food, medicine and bio diversity

Humans have hundreds of native medicinal plant verities, but do not grow them at their home gardens or identified as human habitats. If they could grow these medicinal plant verities in their home gardens they can increase the bio diversity and the freely available natural nutrient profile gifted by the god. If one could make a glass of fresh juice by getting one leaf from each of these plant verities could access the full scale of natural nutrient profile including anti-oxidants, volatile vitamins, required as day to day medicinal requirements as well. But they do not do this and go for synthetic medicine or traditional medicine when they get ailments due to lack of appropriate micro nutrient balance.

Food and energy

Humans cook their vegetable curries for more than twenty minutes and talk about the volatile vitamins, antioxidants and energy saving principles. They suffer nutritional deficiencies and go for artificial vitamin supplements. They develop energy saving cook stoves and try to reduce the fuel input for cooking, but ignoring the loss of nutrients due to overheating.

Food and gut microbial population in humans

Due to alteration of genetic composition of plants, cooking procedures, food processing technologies, humans narrowed down the diversity of gut microbial population and lost their natural digestive capabilities to digest raw foods. Hence they lost natural macro and micro nutrients, antioxidants, volatile vitamin compounds receive from raw foods. Instead, fast food industry developed and non-communicable illnesses spread among them.

Natural production process (Eg. Bee Honey) vs Human production process (Eg. Tomato souse)

Honey bees get nectar from flowers belong to hundreds of species to produce nectar and large number of nutrients are added. Bee honey is a universal medicine. Humans cannot produce it artificially. Production process helps to improve the bio diversity and product quality has a cyclical dependency on bio diversity.

Example: Human production system for tomato

Genetically engineered tomato verities cultivated as mono crops considering only the quality of sweetness.

Production process reduces the bio diversity, increase pest and disease problems, and heavily depends on agro chemicals. Mono cropping reduces the ability to accesses nutrients from different species.

Bees are totally depending on bio diversity to get their foods and humans narrow down the bio diversity for their foods and loose diverse natural nutrient profile. They suffer malnutrition and get artificial vitamin supplements and treat with synthetic medicines for ailments. Hence, collectively experience climatic change and global warming where other living beings also severely affected.

Philosophy and education gone wrong

In order to control this whole chaos, humans have developed administrative and political ideologies, philosophies, doctrines and theories to share the resources among countries and within countries and drag the same human development model along the time line. Humans modified teachings of their religious teachers and did what they wanted to do considering only the comfort of themselves ignoring the nature. But, the funniest thing in the twenty first century is they just chant those teachings to get blessings from the god and they teach their man made philosophies to their younger generation and identify it as education.

Real vicious cycle

Humans must understand that they practice individual and collective environmental destruction to upgrade their livelihoods. This is the real viscous cycle which should be addressed in totally different philosophical platform.

New philosophies and sustainable development goals

It is very funny to say that protocol that has been given earlier by the god, was forgotten and humans are trying to rewrite again similar protocol with his own words to act globally as a one community to save the planet by addressing this crisis situation. Sustainable development goals, could be considered as one of the successful latest attempts made by humans to address these crisis situations. With these common attempts, humans are trying to work as a common group of living beings to share natural resource while protecting the environment.

Strategic paradigm shifts needed during the transition period

1. Formulate an appropriate definition for the human habitat and Identification of appropriate land parcel for future human habitats
2. Identifying new geopolitical approach to improve community participation
3. Practice new consumption patterns to absorb freely available natural nutrient profile
4. Reduce mono cropping and practice small scale farming systems, including home gardening with appropriate supply chain management systems as a community responsibility
5. Practice surface and groundwater management, utilizing and management of floral ecosystems as a community responsibility as a community responsibility
6. Develop methodologies to affiliate primary, secondary and tertiary level education systems into support the increment of GDP

Formulate an appropriate definition for the human habitat and Identification of appropriate land parcel for future human habitats

Planet has a unique terrain features comprised of highlands, lowlands, and water ways in between. Forest cover in the highlands reduce soil erosion and facilitates infiltration. During the rainy periods, a part of the surface runoff recharges groundwater aquifers and stores in water bodies such as tanks and reservoirs, and rest flows in rivers and streams. Infiltrated water in underground aquifers maintains flows in streams and rivers during the dry periods. These terrain features and the hydrological processes support and provide habitats for all living beings.

Human lineage was originated about 2.5 million years ago in dense forests in east Africa (Charles 2011). Subsequently, people migrated from forests and settled down in savannas. With this radical change, food consumption patterns have changed, and selective mono cropping was started. Gradually the land use pattern was changed due to the expansion of mono cropped fields and horizontal expansion of human settlements. Diversity of flora and fauna reduced drastically in the encroached lands, which contributed to creating adverse impacts on the climate, globally as well as locally (Gunasena 2018).

Humans have passed several development phases. The Stone Age, Bronze Age, and Iron Age (Essential humanities 2013), were followed by the green revolution and industrial revolution. It is now heading for the fourth industrial revolution with increasing needs for growing population (Klaus 2016). Historically, the livelihood requirements were achieved by expanding settlements horizontally, while compromising ecosystem services and resilience and exaggerating the vulnerabilities to climate change.

Mahendra and Seto (2019) showed the irreversible land development that affected the consumption patterns of resources such as land, energy and water. Some of the issues illustrated by Mahendra and Sato are associated with the expansion of urban areas. They include increase in per capita cost to provide public services, social costs associated with congestion, pollution, and the inefficiencies associated with increase in volume and height of buildings constructed as human settlements. They have identified three strategies to manage urban expansion for increasing equity, productivity, and environmental quality. These strategies include assembling and redistributing land into a mix of plot sizes, providing affordable housing such as land re-adjustment with the community participation in low-income informal settlements. These justifies the vertical expansion or upward growth of human settlement in cities. Even though the sky scrapers provide housing for growing population, the horizontal expansion of sky scrapers everywhere will not provide sustainable solution for the fragmentation of lands and its impacts over ecosystems.

To address the issues raised by Mahendra and Seto (2019) it is proposed to expand human settlements vertically along the interface where highland meets the lowland areas. Selecting the interface could be identified as the unique feature proposed by the author, compared to the global approach discussed by Mahendra and Seto, which does not provide criteria to identify specific land parcels to minimize the impact over ecosystem services and resilience. This Interface was selected to free the upper catchment areas for planned agriculture and afforestation. It is also expected to minimize impacts over natural drainage patterns heading towards tanks in cascades. Better management practices are proposed to improve the groundwater recharging along drainage lines towards tanks in cascades. Hence, the ecosystem services and resilience will have significant improvement against devastating climate change impacts.

Vertical habitats could also be established along the foot of mountain areas, along road sides, around wetlands and other water bodies etc. This will release the ecological pressure upon these ecosystems and areas to be kept as natural forest covers or to be cultivated with soil conservation measures will be increased. Accordingly, natural infiltration process and groundwater recharging process will be improved. Soil masses in hill tops will hold enough water as soil moisture to be released nearby streams, water springs and reservoirs during dry spells. Therefore, these vertical habitats will act as a climate change mitigation measure, allowing to manage ecosystem services and resilience efficiently than horizontally expanding human settlements over the mountain tops. Furthermore, vertical habitats will minimize fragmentation of natural ecosystems in hilly areas and improve the livelihoods of humans living around the mountains environmentally as well as aesthetically.

Furthermore, managing power and telecommunication, water supply, sewerage, drainage services and establishing solid wastes recycling projects could be much easier. Cost effectiveness of these services will be much higher than in traditional horizontal spreading settlement schemes. Proposed vertically expanding human habits will provide opportunities to build up human livelihoods as a community, not only accepting the cultural and ethnical diversity but also baring the responsibility of sustainability of ecosystems as a community responsibility. Everybody can have an apartment according to their income level, while enjoying the aesthetically pleasing environment collectively.

In addition to that, vertical expansion will minimize the impervious areas created due to anthropogenic activities. Presently, due to this imperviousness considerable amount of the surface is covered by a crust made up of concrete and asphalt halting the infiltration process with increased overland flow. This could be one of the reason to sea level rise.

Identifying new geopolitical approach to improve community participation

Geopolitics can be described as a socio-political approach that should be maintained by the governing body as a responsibility of the general public to maintain sustainable international relations in any country, to improve the livelihoods of the people and to manage natural resources.

It is a kind of systematic approach to be followed by the governing body of any country and the general public to exchange environmental responsibility between the governing body and the general public at a high level to help manage ecosystem services and maintain strong international relations. It could also be defined as a geopolitical approach having a series of strategies, that any government must implement with the participation of the public, thereby implementing efficient supply chain management systems and dynamic production and marketing strategies to maintain the sustainability of local ecosystems and sustainable international relations.

It is also can be called a role to play by any governing body of a country with the community participation to maintain a healthy diplomatic and international relations by managing natural resources according to local geographical, geo morphological and climatological aspects of all ecosystems of the respective country. It can also be defined as a system of social, environmental and political ethics that must be enforced by the governing body of the country as a civic responsibility.

Practice new consumption patterns to absorb freely available natural nutrient profile

Natural ecosystems consist of highly diverse edible flora species specially within the tropical belt of the country. But presently, we are not using the whole nutrient profile that could obtained from the natural ecological systems. Research and development must be carried out with the collaboration of the university system to develop new cost effective food items from unexplored edible biodiversity. There is a possibility of introducing new consumption patterns blending with cultural events. Sociological value could be given to these new consumption patterns by promoting dialogs among communities as a day to day general talk like “How is weather today” to begin a conversation. Say for an example, a social dialog could be formulated to discuss about indigenous rare fruits and vegetables plants availability in home gardens, new food items prepared and medicines could be derived from native plants etc.

Reduce mono cropping and practice small scale farming systems, including home gardening with appropriate supply chain management systems as a community responsibility

In order to support the changing consumption patterns, following methodologies could be adopted. Preparation of hand book of fruits, vegetables and medicinal plants could be carried out with the help of local universities and research institutions. Data could be collected from local grass root level administrative units. Based on the information collected nurseries could be established to proliferate

planting materials. Temples, Churches and Kovils could be use their lands to establish nurseries to proliferate these rare plant varieties and distribute among devotes.

Instead of practicing mono cropping in large fields, small and medium scale farming could be encouraged by linking those micro scale farming lots with a well-established supply chain management system. A mobile application could be introduced to both producers and customers share their needs and products. Whole sale purchasing could also be facilitated to supply collected bulks via supply chains for export marketing. Organically grown products could be well managed with the micro level farming approach and production ethics could be developed as a code of ethics to be practiced as a community responsibility.

Mass media communication methods could be used to popularize these consumption patterns. Multinational companies who are running the food and beverage industry could be join hands with the community based organizations to purchase bulks and go ahead with the value addition.

Develop methodologies to affiliate primary, secondary and tertiary level education systems into support the increment of GDP

Based on the hand books developed about indigenous and rare edible flora, students must be trained to identify those plants and familiar with importance of the fruits, vegetables and medicinal plants for their day to day requirements as foods, medicines etc. at home garden level. As discussed earlier individual or family level destruction process could be minimized by getting the contribution of school community to improve the gross domestic production of any country.

This has to be conducted as an academic exercise which has to be evaluated and marks should be given to students based on their contribution to the improvement of domestic production. Class room based productively measurements have to be carryout as an academic activity. Each student must be considered as one producer. Land availability for the cultivation at home garden level must be estimated based on the school grade level and finally, could be summed up to get the total land availability for the entire school. Students or the producers must be guided to cultivate large number of fruits, vegetables and medicinal plant varieties as much as possible to increase the plant diversity of the home garden. In this case they have to convert their garden fence in to an edible fence with potential plant varieties. Cultivation has to be monitored with the assistance of Agricultural Instructors of the Department of Agriculture. All must be grown organically. Student having higher number of plants could be graded as “A” grade garden. They have to keep records of how they use these plants for their day to day requirements namely, as foods, drinks, or medicinal purposes. This will enhance their knowledge about plant diversity and how they could depend on the diversity to full fill their day to day requirements. Consumption of large number of fruits, vegetables and medicinal plant varieties will increase their access to natural nutrient profile and help them to keep away from fast foods and over consumption of excessive calories and eliminate the vulnerability to noncommunicable diseases, over weight etc. Productivity charts must be prepared for each class where, planting dates, harvesting dates could be displayed for production planning.

They must be able to consider the class room as a large family unit and individual food requirement must be calculated for each family member. Some students or producers may do not have enough land parcel to cultivate and family members of these students must be fed by others who have enough land. A land index could be developed by dividing the land area of individual student by the total class room land area to grade students based on land availability. Another land index could be developed to estimate the cultivated land area with respect to the individual land availability. This will indicate the land utilization for the production. This will help them to understand how much they use and how

much they do not use. At the same time, they will understand the number of family members they could feed if they grow these land extents.

Similar exercise could be carryout for the entire school with a properly managed database using computers. Friday one hour after school could be used to share individual production with others. Individual producers could bring their harvest each Friday and harvest could be kept at one place in the school to be carried out by needy students for their families free of charge. This will help them to save some amount of money spending for foods. This kind of savings at national level will have great influence in development sustainability in many ways.

This will enhance the bio diversity at national level, use of large number of fruits, vegetables and medicinal plants will increase the macro and micro nutrient consumption leading to healthy nation. Education then will become not only a service provided by governments but a diverse production system of the country. Students those who follow these instructions will understand the nature in a productive way and learn to share their resources efficiently and collectively.

Production and value addition could be started at micro scale as well as macro scale interventions. Micro scale intervention is very clear and that is we have to re define the human habitat with respect to the goods and services we receive from it. Macro scale is to link the micro scale primary production system with macro scale value addition without going for mass scale mono cropping followed by necessary micro and macro scale technological interventions.

Legal provisions must be introduced to land owners to share their lands in a trustworthy manner with land less people only for production purpose. A policy has to be developed and implement via field level agricultural instructors. Memorandum of Understanding must be signed between both parties to begin activities and it must be signed front of a lawyer. In this MOU it must be clearly stated that lands are only shared for cultivation and not for any permanent or temporary settlements. Furthermore, MOU could be canceled at any point of time by compensating the cultivation. Those who cultivate under this policy could be identified as micro scale producers, must agree to cultivate organically and these producers must maintain a minimum level of bio diversity with prescribed plant varieties as a base plantation which will again increase the national level bio diversity with traditional and uncommon fruits, vegetables and medicinal plant varieties. Their products must be certified by the department of agriculture. Size of the one land parcel must not exceed one acre which could be the ideal land parcel to be cultivated under organic practices and principles.

Linking micro scale production systems with macro scale value addition systems

Micro scale production units must be linked with macro scale producers to carry out value addition and further processing. Any Middle man, corporative societies, farmer organizations, other community based organizations, and any type of social network could be used as harvest collecting and distribution agency. Growers must agree to supply the harvest with desired quality parameters to the local collecting centers and these centers have the responsibility to deliver good quality raw materials to the ultimate macro scale producer who produce value added products. Value addition or further processing could be carry out with organically grown products having less postharvest losses. With this micro scale production system necessity of mono cropping in large farmlands could be minimized. Even for exporting, organically grown products could be cultivated with this out grower production system. Furthermore, these products could be marketed with public private partnership.

Practice surface and groundwater management, utilizing and management of floral ecosystems as a community responsibility

In order to manage overland flow, infiltration and groundwater flows, there must be a field level mechanism to execute necessary management strategies as a community responsibility. This could be easily achieved by defining a manageable geographical land parcel, which could be managed by a group of stakeholders. Basically, this management strategy could be identified as ecological cascading.

An ecological cascade could be defined as a geographical area having ten to fifteen individual land plots or home gardens, which are hydrologically interconnected via natural drainage lines. This geographical land parcel consisting individual land plots could be a micro catchment existing in a sub basin, or a river basin having a first, second, third or fourth order streams or a small water way in hilly areas or having one or two natural drainage lines or small water ways in flat lands.

In order to manage these ecological cascades efficiently, all land plots within the cascade must be connected via natural drainage lines and finally all these ecological cascades must be interconnected via streams or drainage lines till the drainage meets a river, a reservoir or any other water body.

Individual plot owners must be aware about groundwater recharging when possible to replenish groundwater reserves and manage surface waters to minimize sediment transport and high flow rates causing soil erosion as a community responsibility. Managing surface and groundwater reserves may help vegetation to thrive well in these area, where biodiversity could be increased without much effort due to increased ground water table and this will indirectly help to change existing consumption patterns towards new consuming habits which are highly depend on the edible biodiversity.

Conclusion

It is clear that existing scientific advancements, philosophical thinking, various religious doctrines developed, political theories found by humans created a gap between the human development model and the natural environmental model. Therefore, there is an urgent need to revisit the human development paradigm and shift the research and development directions and must formulate naval strategical approaches to manage the existing crisis situation and handover clean resourceful environment to our future generations.

Newly developed SDGs are well addressed these existing problematic scenarios and proposed six strategic approaches will help to find better solutions as a community responsibility of restoring what is destroyed by existing anthropogenic activities.

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