Youth and Sustainable Development , Agriculture Food and Nutritional and Livelihoods Security

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The UN Sustainable Development Goals, the theme “Youth and Sustainable Agriculture, Food and Nutritional and Livelihoods Security”. Youth constitute a majority of the population in the developing countries, who mainly live in the rural areas. Thanks to the increased emphasis on right to education, illiteracy is slowly disappearing. The goal of **Nutrition** **Literacy For All** propounded by UN FAO is now becoming an achievable one. Agriculture comprising crop and animal husbandry, fisheries, forestry, agro-processing and agri-business provides employment to a majority of the population in developing countries. However, a recent review of the progress made in achieving the UN Sustainable Development Goals, particularly the new SDG2: "End hunger, achieve food security and improved nutrition and promote sustainable agriculture", reveals that we still have a long way to go before this particular goal is realised.

It is, therefore, essential that we step up our efforts to convert the demographic dividend arising from our young and educated youth into an asset from the point of view of alleviating hunger and poverty. It is clear from the available experience that youth will be attracted to agriculture and rural development related activities only if they are intellectually stimulating and economically rewarding. Accordingly, an appropriate synergy between technology and public policy is critical for launching a “**youth in Sustainable agricultural movement”**. Some of the available opportunities in India for this purpose .

Mahatma Gandhi mentioned over seventy years ago that the worst form of brain drain affecting the future of developing countries is the migration of brains from village to the city. He also mentioned that that we can hope to achieve rural transformation and agrarian prosperity only through the marriage of brain and brawn. This is why agriculture has to become a technologically attractive option while young people embark upon shaping their future. At present, Business Process Outsourcing (BPO) has become an important source of income generation mainly in urban areas in many developing countries, to perform tasks on behalf of industrialized nations. What we should try now is to ensure that BPO shifts from urban to rural areas also. In addition, youth is involved in extension and advisory services for imparting knowledge as well as empowered to take secondary and specialty agriculture related activities for higher productivity, improved efficiency and increased income. These options will provide new opportunities for intellectually satisfying work for the educated rural women and men and thus help in attracting and retaining youth in agriculture and rural development related activities. Youth can also play an important role in achieving the Zero Hunger Challenge by serving as Community Hunger Fighters. They could be involved in establishing Genetic Gardens of Biofortified Plants, so as to provide agricultural remedies for the nutritional maladies widely prevailing in many developing countries, mainly in Sub Saharan Africa (SSA) and South Asia (SA).

COMPONENTS:

1. SUSTAINABLE DEVELOPMENT
2. FOOD SECURITY
3. NUTRITION **Literacy** for All
4. INDIVIDUAL DEVELOPMENT
5. WATER CONSUMPTION PRACTICES

**OBJECTIVE OF THIS PROJECT:**

Club/Cluster Action based on skill enhancing and overall soft-skill development of individual, centred on Agriculture. This can also be integrated into the high school curriculum as vocational programmes. Suggestions:

1. Agriculture Mechanics: Skill development in allied agricultural sectors, like farm equipment maintenance. This would help in rural self-sufficiency and as a sustainable income for the youth. Education about safe equipment operation is also relevant.
2. Agronomy: Plant-breeding and the science of reclaiming farmlands (soil quality, nutritive value of produce, etc.) through organic means requires intensive participation and extensive knowledge about insects, weeds and herbicides. Involvement of agricultural universities is important in this endeavour to ensure application of scientific knowledge.
3. Agri-Business and Marketing: Produce requires proper value addition and storage facilities to ensure profitable market prices. The government and its nodal agencies have a part to play in this. Training in marketing strategies and information about market climate needs to be made available to young farmers. For this appropriate agencies have to be identified and technology developed, to support once these high-schoolers enter farming.
4. Food Sciences: Training and Technical Support has to be provided for youth to engage actively in secondary value addition of produce. Food preservation techniques such as jamming, pickling, jarring, canning, bottling etc. are effective value-adding procedures. Conducting them on a domestic level using traditional methods will reduce costs and carbon-print.
5. With respect to dairy and poultry activities, breeding, keeping and feeding need to be taught with expert-consultancy keeping sensitivities to cultural and regional diversity in mind. Dairy, especially gives out a wide range of products, including those for manure and organic farming. Bio-gas production can be set up allied with dairy and poultry farms.

**GOALS:**

Junior Clubs (Age Group: 9-15 years)

***Composition:***

The clubs will include every child in the school that fall in this age group without any discrimination on the basis of caste, class, religion, gender or family background. There will be no kind of fees collected from the members.

***Functions:***

Clubs formed at schools will focus on increasing nutritional awareness, consumption practices and safe drinking water for all in a non-discriminative fashion. Each club will consist of a maximum of 20 members, with even distribution of boys and girls. Hence multiple clubs can be formed in each school.

Clubs will have a leader, who will be nominated by a teacher from the school. The leader will be aided by the school-coordinator, who will be a permanent teacher at the institution. Decisions that are taken on the behalf of the club will be presented, passed and implemented by the Club Leader. The leader has also the responsibility to organize meetings and other recreational activities for the club and will be responsible for the smooth functioning of club. The tenure of a leader will be one year or till the next leader assumes office.

Parents of members will also have a role in the activities of the club, by ensuring that their children attend club meetings regularly, follow directives of the club in terms of nutrition, health and environment practices, and a choice of chaperoning the members on field trips and retreats etc.

An annual talent show of the club members will be conducted on the Club Day- which will be observed on January 12th of every year, being National Youth Day. The Club leader with the help of the school coordinator will also present an Annual Report on the activities of the club members.

**Ensuring price stability and safety of Food**

There is now widespread concern on the prevailing high rate of food inflation. Inflation in vegetable prices is particularly high, rising to 12.9% in May from 2.2% in April. Obviously this will further aggravate the problem of malnutrition, highlighted recently by the Global Nutrition Report. This year’s price rise is not new, such a situation occurs now and then. Therefore a permanent solution to food inflation should be found.

Urbanisation in India is growing and the problem of food inflation largely rises from the demand-supply gaps in urban areas. One way of stabilising the prices of vegetables and fruits in urban areas is to promote peri-urban horticulture by providing the necessary technical and marketing support. Decentralised production, as for example in Israel, could be supported by cooperative marketing. Urban and peri-urban ‘horticulture revolution’ could pave the way for more stable prices to the consumer. At the same time, we should ensure that the quality of the food remains high and free of pesticide residues and other unsafe chemicals. Thus we can ensure stability of supply coupled with high quality and safe food, while contributing to price stability.

We need a peri-urban safe-to-eat vegetable movement based on Codex Alimentarius Standards of Food Safety. What is planned for a festival occasion like onam should become the norm for vegetable production and consumption. The peri-urban safe-to-eat horticulture movement will improve nutrition as well as help to avoid price volatility.

***Activities:***

1. School yard farming and nutrition garden- raising simple vegetables/ tubers/ condiments like tapioca, cassava, yam, sweet potato, birds’ eye chilli, drumsticks, gooseberries etc. These can be incentivised as a cooking-cum-eating day for children, which will also help in disengaging linkages between social and economical groups.
2. Over-all health development- weekly boiled banana/egg, compulsory Games hour.
3. Raising chicks/ poultry through schools.
4. Compost-making, identification of pests and diseases, seedling production, biological control of pests and diseases through schools to cultivate organic farming practices. Groups of children must take up organic farming projects as a compulsory activity.
5. Initiate medicinal garden in the school, identifying local endangered plants of medicinal value and approaching it via a community-based action by school children.
6. Introduce Agri-Sciences in School Curriculum with material and teachers. It can also be introduced as a vocational subject. This will help to identify enthusiastic children who will possibly take up higher studies in Agri-Sciences in University levels and therefore, turn into agriculture business. They can be moulded and mentored in this direction.

(FFS: Farmer-Field-School Model: Training from farmers themselves to introduce the kids to basic farming practices- for eg. Namakkal farmers to train for poultry-related activities. This also brings up a sort of enthusiasm among participants and the field itself acts as a good teacher. Other practices of soil husbandry and irrigation can be best inculcated in this manner. This can also include secondary, value-adding services like handicrafts or pickling.)

***Talk-Activities:***

Activities need to be designed to encourage club members to speak in public. This can be either done in collaboration with the existing language classes or as exclusive club activity, by which each member would have to speak for two minutes in the school assembly.

Power-point presentation contests can be held in collaboration with the area VKC. Through this initiative, the children must be presented with knowledge of computers, MS Office and other simple tools that aid in day-to-day life.

Senior Club (Age Group: 15-25 years)

***Composition:***

School drop-outs, Youth engaged in Farming, representatives of Youth Organisations, University students and interested youth will be included in these clubs on a community-level interaction, arranged in collaboration with the local governing bodies, VRCs and VKCs. There will be no discrimination on the basis caste, class, religion or gender. Special incentives to attract female members have to be taken by collecting their concerns and finding solutions to it. Nominal fees may be collected from members monthly (~10-25 INR).

***Function:***

**To train** youth in agricultural production using contemporary systems and modern information and communications technology. Provision of **land rights** to youth and youth organizations will encourage socio-economic development. Facilitation of **access to credit** must be done so as to promote youth participation in agricultural projects. The centrality of **education and skills development** programmes for wealth creation, socio-economic integration and empowerment is very eminent. Enhancing the **attractiveness of rural areas** to young people by improving socio-economic infrastructure will attract more youth to agriculture.

Clubs will have a President, who will be elected by majority vote. The President will be aided by the general body/ implementing committee formed by the nodal agency, consisting of secretary, treasurer, coordinator etc. Decisions that are taken on the behalf of the club will be presented, passed and implemented by the Club President. The President has also the responsibility to organize meetings and other recreational activities for the club and will be responsible for the smooth functioning of club. The tenure of a President will be one year or till the next president assumes office.

***Activities:***

1. (FFS- Facilitator) Youth already engaged in farming or related activities [traditional farmers, Agri Univ Grads, skilled personnel who have undergone training through ARYA] will act as mentors to the club in terms of providing insights into the agricultural methods, soil husbandry and gainful practices, etc.
2. Nodal agencies in collaboration with universities must offer demand driven short and long term diploma courses at certificate to diploma level in agricultural based programmes to equip farmers and other stakeholders with better farming skills and agribusiness management. In FFS itself, can implement AESA program- Agro Eco System Analysis targeting Agri univ graduates.
3. Compost-making for organic farming.
4. Focus on certain niche products like mushroom, flowers, production of planting materials like grafting, cutting layering, seedling production. (AYC in Mauritius)
5. Initiate action in solving community problems like water, electricity etc. for the village.
6. Establishment of VKCs and VRCs.
7. Farm Marketing Management Agribusiness and MME.
8. Job-readiness training for Personality Development: To impress a sense of professionalism and soft-skill enhancement, such events/ workshops such as finishing schools should be organised by the club to help members be ready.
9. Incentives/ Support:

Tech Support thru’ talks, demos, PPTs, film shows

Field visits for advice and improvement

Free leaflets, pamphlets regarding talks and demos etc

Free distribution of seeds, fruiting bags, planting material

Free distribution of agri equipments

Scholarship in Agri Univs for active members

1. All these experiments ought to be conducted through Panchayat Institutions.

i.In my view our national water security system should consist of the following six essential action points: first, is the augmentation of supply through mandatory rainwater harvesting, and politically, ecologically and economically feasible inter-basin transfer. Second, the efficiency of water use through appropriate land use planning which involves the choice of crops suited to the local water availability conditions. Third, there is need for involving local communities and panchayats in the co-governance of land, water and energy, the efficacy of which has been demonstrated by several grassroots workers including Salunke in Maharashtra, who promoted pani panchayats, and Rajendra Singh in Rajashtan, who showed the power of community water harvesting. Fourth, the popularisation of technologies like sprinkler and drip irrigation on a large scale particularly for perennial horticultural crops. Fifth, sea water constitutes 97 per cent of the world’s water resource. Nearly 25 per cent of our population live near the coast. There are ample opportunities now for bio-saline farming using sea water and available fresh water. Finally, public policies should aim at the sustainable use of groundwater resources since nearly 60 per cent of the irrigation water now comes from tubewells. Demand management is even more important than increasing supply

ii. **Agriculture as the engine of job-led growth**

Recent media reports suggest that increasing demands for reservation in the public sector may be linked to the stagnation of agriculture and growing agrarian distress. Agriculture promotes job-led growth, if there is integrated attention to on-farm and non-farm employment in rural areas. In the Sixth Five Year Plan (1980-85), Prof.M.S.Swaminathan introduced a sub-chapter on ‘A New Deal for the Self Employed’. Unless opportunities are created for economically rewarding and intellectually satisfying self-employment for youth, competition for jobs in the organised sector will grow, as will the clamour for reservation.

iii. **Smart villages**

The late Dr Abdul Kalam stimulated widespread interest in rural development by emphasising that our villages should also have access to urban amenities like energy, water, sanitation, healthcare, education etc. Of late, there have been several initiatives both in India and abroad on methods of achieving this goal. A recent one is the initiative of a group in Cambridge, UK, in the form of organisation of ‘Smart Villages’. Smart Villages under this programme consider “access to sustainable energy services as a catalyst for development, enabling the provision of good education and healthcare, access to clean water, sanitation and nutrition, the growth of productive enterprises to boost incomes and enhanced security, gender equality and democratic engagement”. Sir Brian Heap of Cambridge University, a prime mover of this concept, wishes to extend the Smart Village movement in India. Since the government is now actively promoting Smart Cities, it is important to also promote Smart Villages.

iv. **Biotechnology and UN Sustainable Development Goals**

Two important SDGs are “**End hunger, achieve food security and improved nutrition, and promote sustainable agriculture” and “Take urgent action to combat climate change and its impacts”**. Several scientists are of the view that the use of genetic engineering techniques will be important to develop crop varieties which can help to achieve these goals. There are however difference of opinion on the value and safety of such biotechnological tools. I would suggest the following steps for coming to a consensus on this question.

1. Develop scientific guidelines for the choice of the problem to be taken up for genetic modification. Is there an alternative to recombinant DNA technology like marker assisted selection, genome editing etc?
2. Develop procedures for field testing of the GM material in the breeders’ assembly line based on the principles contained in the Cartegena protocol on biosafety. The field testing should be done in full consultation with State Governments and in the fields of public good institutions such as Agricultural Universities.
3. Develop science based methods of assessing risks and benefits. Such procedures coupled with the results of field trials can help to decide whether the GMO pathway is the safe way for achieving the desired end result.
4. Promote biotechnology literacy and establish resource centres for the mass media. Such media resource centres should help to promote public information and education and not become propaganda agencies.
5. Develop a suitable insurance policy to small farmers, so as to insulate them from risks beyond their control, such as drought.
6. State Governments and State Agricultural Universities should be involved at all stages, both in field testing and approval for cultivation.
7. Introduce a Parliament approved National Biosafety Act.

v. **Eternal vigilance is the price of stable agriculture**

Recent reports indicate that a devastating whitefly attack on cotton is reducing yields drastically, in Punjab and Haryana. The introduction of Bt cotton helped to overcome the problems of bollworms which are also serious pests. Today the cotton farmers are suffering from the twin problems of whitefly attack and low prices. Adopting measures for effective plant protection against all the important pests and reducing price volatility are essential for the cotton farmers to get a steady income and the textile trade to get a steady supply of raw material.

The whitefly attack should not come as a surprise since whenever one dominant pest is controlled, the pest which was not important earlier becomes serious. For example, when dwarf wheats were introduced in the early 1960s, the wheat rust problem became less serious since the new varieties were resistant to the prevailing races of stem, stripe and leaf rusts. However, soon ‘loose smut ’ in wheat may became a dominant disease. I have pointed out that if the average temperature goes up by 2 deg C as a result of global warming and climate change, we will have to cultivate potato through true sexual seeds and not through tubers as is the case, now. This is because aphids which are vectors of virus diseases will multiply fast with a higher temperature and cause severe viral infection. If we want to insulate our agriculture from violent undulations in production and prices, we should adopt the principle of eternal vigilance and undertake continuously an action-reaction analysis and appropriate proactive action.

vi. **Funding “public good” National laboratories**

Scientific research is increasingly becoming oriented towards immediate commercial profit than on short and long term public good. A recent report suggests that CSIR laboratories have been asked to find funds for their research. This approach can help to promote research on topics of current market interest but research dealing, with issues requiring sustained long term commitment will suffer. In agriculture for example, public good research institutions are essential for developing technologies relevant to resource poor farmers operating small holdings. Such farmers constitute the majority of our farming population. Public good research involves more investment on long term basic and strategic research. For example, National laboratories can cooperate with private sector laboratories in the area of translational research, i.e. converting scientific findings into field level applications taking into account considerations of ecology, economics and social and gender equity. The Science Advisory Committee to the Cabinet should go carefully into this question and recommend to Government a long term funding strategy, which will help to achieve a balance between public good and private profit.

vii. **Education for the UN SDG in the field of Sustainable Agriculture**

The initiative of the Avittam Thirunal Government Vocational Higher Secondary School, Moncompu is a path-breaking adventure in education for sustainable agriculture. This school is initiating on February 6th, courses in different areas of agriculture which are designed to promote training which will help to achieve Goal No.2. A sustainable agriculture course will be introduced at the 10 +2 level. The school is located at the Kuttanad region of Kerala which has been designated by FAO as a Globally Important Agricultural Heritage Site. The additional facilities including new laboratories for soil and plant health were constructed at a cost of Rs. 57 lakhs provided from my MPLAD funds. I hope this will be an example for other schools located in agriculturally important areas, so that sustainable agriculture becomes the norm in Rural India. Dr Bruce Alberts, one of world’s leading biological scientists and former President of the US National Academy of Sciences, has emphasised the urgency of empowering great teachers’ in order to improve the quality of education.

I quote from his editorial in *Science* (15 Jan 2016) ***“Unless the United States can make dramatic advances in empowering its teachers, the nation will never have public school systems that make the best decisions for their students. Nor will it be able to attract and retain the highly talented teacher corps that every nation needs”****.* This is what an old Chinese Proverb stresses, ***“If you are thinking one year ahead, plant rice; if you are thinking ten years ahead, plant trees; if you are thinking a hundred years ahead, educate the people”***.

We recently organized the Make in India week (13-18 February 2016). This is a welcome revival of the Swadeshi Approach of Mahatma Gandhi of which the Charka and Khadi became the most powerful symbols. Hence these soil enriching, climate resilient, and nutrition enhancing crops should lead the way in the programmes for Make in India in Agriculture.

viii. **Climate Change**

The recently published Fifth Assessment Report of IPCC, finds beyond reasonable doubt that Earth’s climate is warming .The temperature projections for South Asia indicate that by the mid 21st century may exceed over 3°C, over higher latitudes under high emission Scenario. The frequency of hot days in South Asia is likely to increase further in the future.

Rainfall projections for South Asia indicate occurrence of more rainfall at higher latitudes by mid 21st century under high emission scenario. Rainfall trends, including extremes, are characterized by strong variability, with both increasing and decreasing trends observed in different parts of South Asia. Observations also show that there have been more extreme rainfall events and fewer weak rainfall events in the central Indian region.

Sea level rise: Global mean sea level will continue to rise during the 21st century. The magnitude of sea level rise likely be in the range of 26–55cm. This trend significantly increases the risks for South Asia’s coastal settlements, as well as for coastal economies, cultures and ecosystems, particularly if combined with changes in cyclone frequency or intensity. Low lying, densely populated coastal areas in South Asia, including India and Bangladesh, will be at increased risk of storm surges, putting many millions of people at risk.

The key risks identified for South Asia include water and food shortages linked to rising temperatures, extreme temperatures and drying trends. Tropical and subtropical regions of India are projected to be vulnerable to increasing temperature and CO2 level, with a decline in rice yield of as much as 23% by 2080. The decline in productivity could lead to higher food prices and living costs, malnutrition, and worsened rural poverty

adaptation programme is to build capacities at the local level to manage climate risks. A mini agro meteorological facility as set up at the project sites to record real time data on precipitation, temperature and humidity. This information was disseminated through a network of VKCs on a daily basis. Select people were trained to record and interpret these data which helped practice weather based farming by the local farmers. Over a period of five years the farmers developed their own rule of thumb to manage climate risks associated with specific agricultural activities. The project helped bring a scientific outlook to the existing local adaptation practices. The project highlighted the need for location specific adaptation measures and for participatory research and knowledge management. Following the success of this project a cadre of Climate Risk Managers from select places across states were trained in the art and science of climate risk management.

We should now establish in every Panchayat a **Soil Health Conservation and Amelioration Centre** which will provide farmers with Soil Health Cards and help them to not only maintain but enhance soil health. We have an excellent National Soil Survey and Land use Planning Institution at Nagpur under the umbrella of the Indian Council of Agriculture Research. Soil Survey data are useful at watershed, irrigation command area and farm levels for a variety of purposes such as crop planning and rainfed agriculture, depth and frequency of irrigation in command areas, and drainage arrangements. The National Bureau of Soil Survey and Land use Planning has developed methodologies for relating soil survey data to the choice of cropping and farming systems. The wealth of soil information available in soil survey reports and maps must be communicated to the farmers. Every Village Knowledge Centre should have adequate information on the strengths and weaknesses of the soil resources of the village and of methods of optimising agricultural production based on efficient soil management.

In particular the organic matter of content of tropical soils is low and building up soil organic matter is an urgent task. Organic farming helps to improve soil physics, soil microbiology, and soil nutrient status at the same time. Chemical agriculture on the other hand only attends to the nutrient status (like NPK) of the soil. Soil health literacy is important for emphasising the multiple roles of soil in terms of ecological, livelihood and food security. As earlier emphasised the world will have over 9 billion people in 2050, 2 billion more than today. Food production will have to grow by 60 percent to feed the larger population with better quality food.

Well managed soils also help to improve water management. In the heavy black soils of Madhya Pradesh, two crops can be taken provided a ridge and furrow method of planting is adopted. The furrow serves the purpose of inter-row water harvesting. Thus, a good crop like Soybean can be raised on the ridge during the *Kharif* season and another crop like wheat or corn or maize can be raised in the furrows during the *Rabi* season. Land use decisions are also water use decisions. Therefore, land use planning is exceedingly important both for irrigation water security and food security. It is to be hoped that the amended system of land acquisition will take into account the need not only for fair compensation to farmers but also the need to conserve land for raising the food and other crops which we need for human health security and for achieving the zero hunger challenge

**Country Context: LANSA**

For centuries agriculture has been the mainstay of the predominantly rural Afghan society. Wheat is the principal food crop, while fruits and nuts and livestock products such as wool have played a large part in subsistence, in local marketed production, and in exports. A major food crisis in the early 2000s led to massive humanitarian intervention. The national rate of child malnutrition has reduced from a catastrophic level of more than 60% stunting recorded in 2003/04 to about 40% in 2011/12, but high levels of hunger and micronutrient deficiencies persist. Much attention is given in humanitarian work to therapeutic approaches to improving the nutrition of vulnerable groups, but the contribution of agricultural development and the food system to improving rural and urban diets also needs to be increased. The recent history and current context of Afghanistan point to other factors affecting the wellbeing of the population. Political fragmentation is enmeshed with military conflict, the drugs economy, cultural diversity, regional extremes of temperature and altitude, and migration. Research is needed in these complex conditions to improve the linkages between agriculture and nutrition, taking into account the conditions of political and environmental fragility and gender issues.

**Micronutrient deficiencies and dietary diversity**

South Asia is the region of the world with the highest levels of iron-deficiency anaemia. There has been little work on understanding anaemia in Afghanistan, except that anaemia prevalence amongst non-pregnant women has been estimated at 25%. Analysis of secondary data on health and agriculture is being conducted in order to identify the drivers of anaemia in women, and the food sources of iron. The diversity of foods in diets is an important factor in enhancing nutrition. For Afghanistan, where bread is the principal

food, lack of dietary diversity probably is very important. Secondary data are also being used to analyse the relationship between agricultural production and dietary diversity. Emerging from the data is the question of how easy – or difficult - it is for people to access food from local markets. Work is also being developed to understand at household level, what are the drivers of agricultural diversity, with a view to identifying interventions which address malnutrition by diversifying farming.

**How will this research make a difference?**

The evidence from this research programme has potential to impact areas from agriculture through food markets, consumption patterns and household nutrition to the policy-making the project “Youth and Sustainable Development , Agriculture Food and Nutritional and Livelihoods Security” will actively engage with stakeholders through a variety of channels and media in order to integrate agriculture and nutrition policies and programmes and to promote coherence among national and international stakeholders in addressing the complex challenges of malnutrition in the regions .