Ever-Green Revolution

The recent episode of 'fertilizer crisis' has kindled huge frustration and discontent in Nepalese farming communities. For people already dismayed by failure of Constitutional Assembly, this tragedy has snowballed their annoyance and irritation. It's not uncharacteristic, farmers after every political change, to expect growth and prosperity in agriculture sector through government well-cultured programs. But, their anticipations have always been a miscarriage. The core reason behind this letdown lies in the government`s sympathy to naturalize Green Revolution overlooking country`s quiddity of small holder farmers and assorted topography.

Endeavors from scientific personnel in Mid 90s uncovered high yielding dwarf varieties of cereals and a package of improved cultivation practice, which significantly amplified the crop harvest. Modern plant breeding tools, improved agronomy coupled with inorganic fertilizers and synthetic pesticides fueled these advances. This progression was later dubbed 'Green Revolution' by the then USAID Director William Gaud. This initiative led by late Norman E. Borlaug, the Father of Green Revolution, was crucial at that time in solving the problem of mass famine. Gauzing the gravity of his work for humankind later Borlaug was honored with Nobel Peace Prize. However, in due course this radical agricultural change brought dozens detrimental ramifications in environment- both physical and social. It was blamed for widening the disparity between rich and poor. Pricey high yielding varieties (HYVs) oblige consistently high doses of costly synthetic additives- fertilizers and pesticides, thereby making the production and maintenance cost much dearer. In addition, many strains of HYVs were engineered in a way to make it unsuitable to be used as seed in next season. Ecologically, this agriculture eroded genetic diversity through monoculture and so obtained homogeny built welcoming environment for pest and diseases, thus increasing the necessity of synthetic chemicals. In long run, the soil became addicted to these chemicals. Thus, the entire scheme compelled small holder farmers to purchase technical packages leaving no alternatives in combining modern, foreign supplied inputs with traditional and indigenous elements. Consequently, small scale food producers and indigenous people were discouraged from their land.

Each political group after laddering in government sketch highly euphonic agriculture programs and policies on the grounds of achievements purchased through green revolution in other countries. It is note-worthy to unearth the upshots of an attempt to photocopy green revolution in Africa. Unlike in India, the effort to reproduce green revolution in Africa turned into a fiasco. The underlying reasons were described under feeble social institutions, corruption, thin physical infrastructures and high diversity of slope and soil type. As Nepal housed similar distinctiveness, it is essential to dissect this matter. Nepal has its own farming system and agriculture here is greatly diverse. Farming in Terai is entirely different than that farmed in Mid Hills and High Hills. Agriculture in Nepal is a way of living. Livestock and forest are important facets of Nepalese farming system. We own affluent biodiversity, water resource and topography proper to cultivate large number of crops and species. Therefore, we should milk resources on the strength of its nature and accessibility as every development process channels according to the socio-economical, political, natural and technological settings.

Although, Nepal lags distant behind in applying synthetic chemicals as compared to India, China and industrialized countries, it is prudent to monitor the unconstructive consequences of such

higher doses of chemicals in soil quality, human health and ecosystem. In addition, we should scan the maturity of infrastructures set in those nations while employing these external inputs. Commercialization in agriculture, indeed, is must for economic development but it entails well developed irrigation facilities, sound market system, good transportation and strong financial instruments. These yet are juvenile in our country. Moreover, small holder farmers, frail economic condition, subsistence farming and complex topography are hurdles for industrial agriculture. So, these days agriculture is receiving different definitions. Several scientists, agriculture development workers and environmentalists are defining current agriculture form of inputting more than a calorie of energy for every calorie of food output as rather inefficient and unsustainable, intensifying the requirement of a sustainable agriculture that can incorporate natural, biological methods with low external inputs and maintain itself with social education and equity. Several nomenclatures have been given for such agriculture form- organic agriculture, permaculture, ecological farming, nature farming etc, but there core aim lies under the canopy of ecological balance, economic efficiency and social justice. This method of farming soundly addresses the problems prevailing in agriculture sector as it relies on low cost inputs, local available resources, diversification and most importantly is anchored with indigenous knowledge. It is also one of the invaluable options to save energy and control climate change. Moreover, this form of agriculture keys our current impediment of fertilizer crisis since it sourced nutrients from varied natural stores for e.g. green manures, plant and animal by products, compost, vermicompost, farmyard manure, bio-solid based products, rock powder etc. Thus far, manure from cattle, buffalo, goat and poultry is the chief fertilizer substitute existing in our society. Green manures consist of both legumes (plants capable of Nitrogen fixation to soil) such as sunhemp, cowpea, soybeans, clover etc and non-legumes such as sorghum, millet. Such plants can be intercropped as well as grown in fallow period. Besides adding nutrients to the soil, it has multiple benefits. Most prominently, it adds biomass to the soil thus increasing micro-organisms and improving soil structure. Additionally, it suppresses weeds and protects soil from erosion. Similarly, fertilizers from animal and plant by-products produce similar benefits. We have several such by-products available in our community such as oil cake and bone. Another most important fertilizer ore is waste produced in our households. Kathmandu alone produces loads of waste which can be decomposed to produce compost and vermicompost (decomposing using earthworms) in industrial scale. This approach largely cracks the problem of solid waste management. Besides, there are several advantageous bio-fertilizers capable of enriching soil fertility and fulfilling plant nutrient requirements. Some of the widely used bio-fertilizers are Rhizobium, Azotobacter, Azospirillum and Blue Green Algae.

Globally, the notion of environmental protection is percolating into the grassroots and this has assisted this new form of agriculture permeate among farmers. Nevertheless, there stands a crowd who eye such natural and organic agriculture as traditional and unscientific method of cultivation. There lies an atmosphere impregnated with scruples over the issues of higher production, achievability and food security through such agriculture. In actual fact, these ecological or organic farming are contemporary practice that human has unearthed based on their experiences. While its existence dates back to primeval times, its importance and use has augmented in recent days with the increment in visibility of environmental destruction. Unlike chemical agriculture, study and research in this new form of agriculture is very remote, thus, it is very unwise to weigh this agriculture with chemical agriculture in same balance. Gradually sustainable agricultural practices

are gaining its tempo but we do lack its proper cultivation practice and strategies to manage pest, disease and nutrients. Hence, there lie copious opportunities of research and study in this field. Embracing this current truth, it is of utmost importance for government to invest in sustainable agriculture. Focuses should be laid on infrastructure development and on programs which benefit local producers and consumers rather than middlemen and multinational corporations. The courses and curriculum for agriculture science in our universities and colleges should be designed as per our country`s requirements, therefore, should be revised in order to generate human resources capable of understanding and elevating Nepalese agriculture sector. It is judicious for academic institutions and research centers in preference to blue sky researches to devote on pragmatic and profitable approaches. Though, there exist some research findings having practical usefulness, lack of harmonization among academic unit, research centre and extension unit has made these findings hollow. With generous intention of promoting local resources, government should heavily invest in agriculture sector. Instead of pouring our nation`s wealth on chemicals, encouragement and support should be given to promote local initiatives in order to establish organic manure industries. It will, in the long run, eliminate foreign dependency on fertilizers, endorse food sovereignty, distill agriculture sector and thereby prompt ever-green revolution.

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