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Power of eight

- Minimal intervention is required to make organic agriculture in Nepal more productive

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Dec 30, 2014-

Farming, which began about 7, 000 years ago in the Middle East, is undoubtedly the most revolutionary discovery of humankind. It allowed hunters and gatherers to settle in one place and presented opportunities for the integrative utilisation of natural resources such as water, animals, sunlight, soil, and plants for food production. This fundamental property of integrative utilisation of natural resources for a successful and environmentally benign farming still prevails.

The fundamental innovations in agriculture, such as mixed-farming, domestication of plants and animals, agricultural tools such as stone axes, sickles and digging sticks, and irrigation, drainage, and storage methods occurred during the Neolithic era. Subsequent agriculture has largely been improving the innovations that were created during the Neolithic period. In this context, it is important for us to focus on agricultural innovations to meet increasing demands for food, fibre,

and energy from the rising global population while enhancing environmental integrity and the sustainability of natural resource bases.

Recent changes

Innovations in the past century, such as during World War II, which witnessed the invention of synthetic chemicals such as ammonium nitrate for bomb making and organophosphates for the production of nerve gas, have underpinned the use of synthetic products into agricultural inputs such as ammonium nitrate fertilisers and organophosphate pesticides. The application of synthetic chemicals for agriculture certainly helped to increase crop yields and supported the rising global population, which increased from 2.5 billion in 1950 to 7.2 billion at present. The estimated global population for 2050 is 9.5 billion.

Responding to a generation of massive environmental awareness among the general public in the 1960s, following the publication of *Silent Spring* by Rachel Carson, the US government established the Environmental Protection Agency in 1970. Continuous research on the use of agrochemicals in the US has generated information on the links between many agricultural chemicals and human health problems, including various types of cancers—endocrine, kidney, liver, respiratory, reproductive, skin—neuro diseases, developmental problems, and the degradation of environmental health.

Environmental awareness and governmental actions that began in the 1960s were an incentive for organic agriculture in the US, and at the beginning of the 1990s there were many organic agricultural research and development initiatives on the ground.

Going organic

Chemical application in Nepali agriculture has been a matter of serious public health safety and environmental concern in recent years. Use of agrochemicals in Nepal is concentrated on commercialised agriculture. Little knowledge on pesticide types and doses among farmers, extremely weak extension services on pesticide handling and use, and indiscriminate use of insecticides and pesticides in agricultural production have compromised farm workers' safety, caused soil and water pollution, air pollution, high-level of pesticide residues in food and feed products, and negative impacts on beneficial organisms.

Organic agriculture avoids synthetic products such as pesticides, antibiotics, and chemical fertilisers. It relies on bio-fertilisers, bio-pesticides, Integrated Pest Management, improved cropping systems, improved soil fertility, and increased biological diversity. It also requires a strict adherence to established organic guidelines and standards and sufficient buffers and preventive measures between farms to control any spillover effects from non-organic farms.

Nepal has a unique opportunity to develop commercial organic agriculture due to its diverse agro ecology and agricultural biodiversity, abundance of microclimatic zones, the prevalence of traditional, small-holders, mixed-farming production systems, the abundance of agricultural indigenous knowledge, and the increasing demand for organic products domestically and internationally. Meanwhile, most production areas in Nepal are poorly accessible and have high

transportation costs for outside agricultural inputs. Existing suitable conditions for organic agriculture need to be supplemented by better integration of the natural resource base, sufficient farm infrastructure, and an appropriate market mechanism. In addition, widely dispersed and fragmented efforts of organic agriculture need to be streamlined in order to ensure its success in Nepal. There is a need to integrate existing fragmented policies and regulations and develop additional policies to promote sustainable organic agriculture.

Eight elements

To sustainably transform the socio-economic status of Nepal, this writer has founded the Asta-Ja Framework. Asta-Ja, meaning eight Ja in Nepali—jal (water), jamin (land), jungle (forest), jadibuti (medicinal and aromatic plants), janashakti (manpower), janawar (animals), jarajuri (crop plants), and jalabayu (climate)—represent the four spheres: hydrosphere (jal), biosphere (jungle, jadibuti, janashakti, janawar, jarajuri), lithosphere (jamin), and atmosphere (jalabayu) of planet earth and are intricately linked and interrelated. Sustainable use and development of these resources requires the complete integration of Asta-Ja. Simply put, if a small-holder, mixed-farming farmer is involved in organic agriculture, her/his emphasis should be on the sustainable management of all of these eight resources so that synergy will develop, resulting in a higher level of farm productivity and environmental quality. Based on the framework of Asta-Ja, we have established Asta-Ja Three Sisters, an NGO (Asta-Ja Research and Development Centre, Asta-Ja Agriculture Cooperative, and Asta-Ja Abhiyan Nepal), with its headquarters in Kathmandu.

As most requirements for organic agriculture already exist in highly-evolved local communities and their agricultural practices, minimal intervention and outside support will be necessary to transform existing smallholder, mixed-farming into its more productive and profitable commercialised form. This requires a large-scale community awareness programme, governmental planning and readiness, and fast-paced research and development work. Nepal has a wonderful opportunity to launch a massive programme on organic agriculture by forging collaborations among various organisations, involving governmental agencies, universities, international organisations, donor agencies, industries and businesses, community organisations, and related NGOs. In order to spearhead the overall development of organic agriculture in Nepal and effectively coordinate various activities such as policy decision-making and implementation, research and development, market infrastructures, exports, collaboration, and institutional building, establishment of an independent, vigorous, and high-level Nepal Organic Agriculture Development Board is strongly suggested.

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Published: 30-12-2014 06:50