



## Agroecology: A New Imperative for Fundamental Reorientation of Sustainable Agriculture

(\*Neha Kumari)

Department of Extension Education, Bihar Agricultural University, Sabour, Bihar

\*Corresponding Author's email: [nehakumaricoll97@gmail.com](mailto:nehakumaricoll97@gmail.com)

### Abstract

Sustainability in agri-food systems has always been a concern for human survival. Food security has once again attained the critical status among people, today, demanding global attention and action. The current problems of climate change aberrations and highly volatile global food prices and the ruthless greed of Multi-National Food Chain Conglomerates have further jeopardized the food security and livelihood security of common peasants. Hence, farmers worldwide have started realizing the significance of reviving and rejuvenating local agroecosystems. In this context, understanding what agroecology constitutes assumed as imperative to regain local food sovereignty among common peasants. Agroecology is the backbone of sustainable agriculture and has the potential to feed the world and save Mother Nature.

**Keywords:** Agroecology, Local Food Sovereignty, Indigenous Knowledge, Peasant Movement

### Introduction

“Whoever tills the land owns the land!  
He is the Master of his own land and  
So owns the right to eat or sell the food he grows  
Thus, Farmers enjoy the Local Food Sovereignty!”

The hunter-gatherers, the first group of human beings have tilled the land to feed themselves. All people used to practice farming and over a period of time farmers used to own and be masters of their own land. Land ownership gradually came into vogue and farmers used to own their land and the food they grow on their own land. Farmers used to enjoy their food sovereignty. But over many centuries, farmers have started losing this food sovereignty, first to kings in Feudal times, then to Muslim & Moghul invaders, to Zamindars during the British Rule. They are forced to pay Land Cess. Although they owned their land and pay taxes, they owned the food they grew. But with adverse impacts of globalization farmers' food sovereignty is at great risk – in terms of globally-decided food prices by international food traders. Farming gradually slipped out of farmers; hands and farmers p those who feed the Nation – are at the mercy of global traders.

Agriculture today is plagued with the unprecedented worldwide crisis of global food insecurity caused by two giant-like monster problems: the highly erratic climate change aberrations & hydro-meteorological disasters and the ruthless multi-national food conglomerates usurping local food sovereignty and natural resources, jeopardizing the livelihoods of communities, common peasants, farmers, pastoralists, forest dwellers and common people. Addressing these critical issues needs an altogether new perspective,

paradigm and local action framework that would rebuild and strengthen peasant communities and their agroecosystems locally as well as globally.

### **Current Agricultural Scenario**

Global food prospects, especially for the tropical regions, are not necessarily optimistic for this new 21<sup>st</sup> century, despite various current technological advances. Although population growth is now slowing down, overall growth will continue at least through the middle of this century. This means that the land and water available per capita for agricultural production will thus keep declining. To feed the growing populations, the productivity of all factors of production -- not just of land or of labor -- will need to increase considerably in the coming decades.

Unfortunately, further progress with what is called ‘modern agriculture’ -- relying particularly on genetic improvements and increased inputs of purchased inputs -- has become somewhat problematic. Cereal production is not the only measure of progress; however, it is a widely and highly regarded indicator. According to this measure, there has been little improvement in absolute terms over the past decade, while in relative terms, the world’s per capita production of cereals has been stagnant and even declining since the mid-1980s (Uphoff, 2006).

### **Challenges Faced by ‘Modern Agriculture’**

Uphoff (2006), while emphasizing the need for different strategies has highlighted the current challenges faced by farming communities. Today, Indian farmers are facing the following dilemmas and worried about the economic viability and future of agriculture.

(a) Costs of production are increasing, with many farmers starting to experience ‘diminishing returns’ to external inputs. The widening market competition resulting from globalization is putting downward pressure on agricultural prices, so that farmers are caught in an unenviable price squeeze.

(b) Government subsidies that have in recent decades sustained agricultural producers in the U.S., Europe and Japan are now contracting, which means that the economics of input-dependent production need to be reconsidered in those regions; such subsidies are not even being considered any more in the less-developed countries.

(c) Relying on inputs derived from petroleum – many fertilizers, insecticides, fungicides, etc. – is becoming more uncertain and costly as world petroleum markets become more volatile. The crude oil prices of the last 50 years are unlikely to be seen in this century.

(d) Adverse environmental impacts from the application of agrochemical inputs are cumulating, and they are becoming greater and more contested, with increasing government regulation.

(e) Global climate change is going to force some fundamental reorientations in agricultural production strategies. Global warming is likely to be less of a challenge, since it can be adapted to gradually over time, than increased variability of climate – extreme events of rain, heat, cold and drought that take a heavy toll on crop and animal production.

Modes of production that could be successful in the preceding century are thus now less likely to succeed in this one. Already we see a stalling in the expansion of chemical fertilizer and agrochemical use worldwide, as a convergence of increased input prices and lower output prices, with often declining effectiveness or diminishing returns, is curbing global demand.

### **Strategy to Deal with these Challenges**

Globally farming communities have started realizing the significance of nurturing Nature for human survival. So, peasant communities and rural women are trying to revive eco-friendly indigenous knowledge systems and weaning away from dependency on external inputs and making deliberate attempts at restoring and rejuvenating their own agroecosystems.

Agroecology has the advantage of being already available, and being practiced by farmers in different agro-ecosystems. It has received only a tiny fraction of the research resources from the governments. The costs of developing and extending agroecological practices are much less. As will be shown, agroecological methods can match or outperform the results of conventional agriculture, making them more cost-effective. (Uphoff, 2006).

Agroecology offers a paradigm that can be characterized as 'post-modern agriculture' in that it represents a step beyond current agricultural theory and practice. In moving beyond the precepts and practices that are now thought of as 'modern,' it builds upon the most modern science being produced in the contemporary biological and ecological domains. It capitalizes particularly on what is becoming known in the realms of soil biology, soil ecology and microbiology.

### **An Understanding of Agroecology is Imperative**

Core principles of agroecological strategies, as summarized by Altieri (2002) include:

- (1) Enhance the recycling of biomass, with a view to optimizing nutrient availability and balancing nutrient flows over time.
- (2) Provide the most favorable soil conditions for plant growth, particularly by managing organic matter and by enhancing soil biotic activity.
- (3) Minimize losses of energy and other growth factors within plants' microenvironments above and below ground. Losses resulting from unfavorable flows of solar radiation, air and water can be mitigated through microclimate management, water harvesting, and better soil management and protection through increased soil cover.
- (4) Diversify species and genetic resources in the agroecosystem over time and space.
- (5) Enhance beneficial biological interactions and synergies among the components of agrobiodiversity, thereby promoting key ecological processes and services.

Agroecological approaches minimize the use of exogenous inputs, preferring to mobilize the endogenous capabilities of the cropping system and its relevant soil and above-ground environment through optimizing management of plants, soil, water and nutrients.

Agroecology can be defined broadly or narrowly.

- ✓ Loosely defined, agroecology often incorporates ideas about a more environmentally and socially sensitive approach to agriculture, one that focuses not only on production, but also on the ecological sustainability of the productive system. This definition implies a number of features about society and production that go well beyond the limits of the agricultural field.
- ✓ At its most narrow, agroecology refers to the study of purely ecological phenomena within the crop field, such as predator/prey relations, or crop/weed competition."

Agroecology is a scientific discipline that uses ecological theory to study, design, manage and evaluate agricultural systems that are productive and resource conserving. Agroecological research considers interactions of all important biophysical, technical and socioeconomic components of farming systems and regards these systems as the fundamental units of study, where mineral cycles, energy transformations, biological processes and sociological relationships are analyzed as a whole in an interdisciplinary fashion.

Altieri (2002) stated that the scientific basis to sustainably enhance productivity, agroecology emphasizes the capability of local communities to innovate, evaluate and adapt themselves through farmer-to-farmer research and grassroots extension approaches. Agroecological approaches emphasize diversity, synergy, recycling and integration, and social processes that value community involvement, with human resource development as the cornerstone of any strategy aimed at increasing options for rural people and especially resource-poor farmers.

## Global Perspectives on Agroecology by Farming Communities

Peasants and farmers from several less developed nations have started raising their voice through social movements fighting against the exploitation of local agri-food systems by global agribusiness. These views and perspectives belong to local farming communities.

*Agroecology is an agricultural method based on the traditional knowledge of those who cultivate the land and a way of life. The practice of agroecology is critical to addressing global hunger and increasing communities' access to basic resources such as land, water and seeds.*

Here an attempt is made to present and share the perspectives, knowledge and experience of social activists working to promote and scale up agroecology among farmers around the globe. These quotes also highlight the social, political, cultural, nutritional and spiritual meanings of agroecology from within communities that have been negatively impacted by the commodification of food. Here an attempt is made to share the perspectives of members of social movements and grassroots organizations that are building agroecology and highlights the social, political, cultural, nutritional, and spiritual meaning of agroecology to their communities (Whyhunger, 2023)s

As Amarilis Guamuch, the Director of the Women's Association for the Development of Sacatepéquez (AFEDES), a women's movement based in Guatemala, explains:

*"We have been threatened by globalization and mercantilism. Through agroecology, indigenous women are leading a different way of life. We grow healthy food, sell it to others and, more important, we are generating more knowledge and continue saving the seeds."*

**Agroecology is a science and practice defined in the daily lives of millions of families worldwide. It represents both a form of agricultural production and a process for organizing and building community self-determination. As Ibrahima Coulibaly from Mali says,**

*"Agroecology is not an alternative, but a way of life and is one of the paths to end hunger and transform society."*

Agroecology brings communities together in the creation of their own solutions to produce healthy food and conserve soil and water. Agroecology is based on communities having access to and control of local resources like land, water and seeds and on working toward local food sovereignty. Because it is developed by communities and maintained through democratic social movements, agroecology nourishes the local and global struggle for food sovereignty and climate justice, which is growing more urgent every day. Though agroecology relies on local knowledge and local resources, the efforts to "scale up" and "scale out" agroecology are global. "Scaling up" — increasing support from institutions and policymakers — and "scaling out" — spreading agroecology to other farmers and communities — are critical, and the movement is strengthened through sharing the different practices of agroecology from around the world.

La Via Campesina, a global social movement, says,

*"The origin of agroecology is the accumulated knowledge of rural people, systematized and further developed through a dialogue of different kinds of knowledge: scientific knowledge, knowledge of organizing communities, and the everyday practical knowledge of agroecology and food production."*

## "Scaling Up" Agroecology

The question of how agroecology can make an impact at a greater scale has been at the center of the debates among NGOs, scholars, and policymakers at national and international levels. The question of how to increase the number of people and places impacted by agroecology every day is important, and we must recognize that peasant and small farmer communities are at the center of agroecology, both as a science and as a way of life. Bringing agroecology to scale means both "scaling up" and "scaling out" agroecology —

- ✓ Scaling up agroecology by increasing research, training, and supportive policies; and
- ✓ Scaling out by supporting the dissemination of peasant-led agroecological practices through peasant-to-peasant exchanges and training.

Specifically, scaling agroecology up and out needs:

- ✓ Increased funding for social movements' priorities.
- ✓ Support for the rights to land, seeds, and water of local communities.
- ✓ Substantial government commitment, away from policies that subsidize international agribusinesses and toward significant funding for technical assistance for farmers; farmer-led research of agroecological practices; and basic infrastructure of roads, schools, and other services still lacking in many rural communities.
- ✓ Democratic reviews of free trade agreements and other international agreements that disregard and even curb farmers' rights to multiply, store, and share seeds.

### Struggle for Local Food Sovereignty

La Via Campesina International, a global social movement has started mobilizing peasants worldwide for a Fight to regain local food sovereignty. Here is the statement in their own voice:

*“As women, men, elders and youth, peasants, indigenous people, landless laborers, pastoralists and other rural peoples, we are struggling to defend and to recover our land and territories in order to preserve our way of life, our communities, and our culture. The agroecological peasant agriculture we practice is a basic building block in the construction of Food Sovereignty and is the first line in our defense of Mother Earth.”*

*“We are committed to producing food for people: the people of our communities, the peoples of our nations — rather than biomass for cellulose or agrofuels, or for exports to other countries. The indigenous people among us, and all of our rural traditions and cultures, teach respect for Mother Earth, and we commit to recovering our ancestral farming knowledge and adopting elements of Agroecology (which in fact is largely derived from our accumulated knowledge) so that we may produce in harmony with, and take good care of, our Mother Earth.”*

To highlight the social and cultural principles that underlie our peasant view of agroecology, we put forth the following elements — those that we defend and reject

**Table 1: Peasant View of Agroecology (Whyhunger, 2023)**

| We defend Agroecology as...  | Our Agroecology is not...   |
|--|---|
| <ul style="list-style-type: none"> <li>✓ Building autonomy</li> <li>✓ Peasant and indigenous seeds</li> <li>✓ A social, cultural, and political process and a tool for the collective transformation of reality</li> <li>✓ Horizontal dialogue between peasant, indigenous, and “scientific” knowledge</li> <li>✓ New familial relationships against patriarchy, where women play a key role               <ul style="list-style-type: none"> <li>✓ Offering new and important roles to youth</li> </ul> </li> <li>✓ Liberating and strengthening our collective identity as peasants, indigenous peoples, and other social and cultural rural expressions</li> <li>✓ Directed at feeding people healthy food produced in harmony with Mother Earth               <ul style="list-style-type: none"> <li>✓ Communitarian, with anti-capitalist values</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>❖ Techno centrism, academicism, reductionism, or top-down verticals</li> <li>❖ Agrotoxics, GMOs, or monoculture</li> <li>❖ Mere input substitution and neoliberal organic farming that leaves monoculture intact</li> <li>❖ Agribusiness and commercialism</li> <li>❖ The privatization of knowledge and life</li> <li>❖ The commodification of seeds, water, forests, biodiversity, carbon, and nature</li> <li>❖ Land grabbing and large private estates (“latifundio”)</li> <li>❖ Patriarchy and other forms of exploitation</li> <li>❖ The separation of human beings from Nature</li> </ul> |

This gallery of thoughts by social activists embodies the ongoing dialogue of grassroots knowledge and features peasants and indigenous people and help expand the collective

struggle for justice and international solidarity and support of the leadership of communities around the world facing the impacts of the commodification of food and the growing influence of international agribusinesses in our food system.

### **Why We Need Agroecology?**

Agroecology is beneficial for the whole world. Agroecological peasant production is not an alternative! This is the model of production that has allowed us to feed the world for thousands of years, and it is still the dominant model for food production. More than half of the world's population works in peasant agriculture, and the majority of the world's population depends on peasant agriculture for food.

This model of smallholder, agroecological agriculture is the best way to feed the world in the future, to meet the needs of populations today, and to protect the environment and preserve our natural heritage, as well as our common property. The model of the Green Revolution has failed: we have almost one billion hungry people in the world and an impressive number of environmental problems. We need a new paradigm, which is agroecology.

By committing to produce food to feed the world, we have made the commitment to practice peasant, "sustainable agriculture," because only agroecological peasant production can disconnect the price of food from financial speculation and from market distortions, restore land degraded and polluted by industrial agriculture, and produce local and healthy food for urban consumers and for our people in general.

So, agroecology is beneficial not just for the agricultural producers (family farmers), but actually for the whole world. Our future will depend on the attention that we give to family farms, and consequently, to the agroecological practices which underlie their existence. We view agroecology as the fundamental instrument to achieve food sovereignty and resiliency in the face of climate change, but this collides with the interests of large multinational companies.

Agroecology represents a chance for all the producers of food in the world. It also represents a chance for the consumers in the cities. Finally, it represents a chance for sustainability in our environment and our planet. We have only one planet; therefore, we must preserve it for us and those who will come after us. Hence resorting to agroecological approaches and principles has become an urgent imperative.

### **Conclusion**

Regaining the faith of farmers and restoring local food sovereignty needs to be the main focus of attention and this can be achieved through deliberate attempts to rejuvenate agroecosystems and local communities for wide spread diffusion of agroecological principles and sustainable agricultural practices among small holder farmers everywhere around the globe,

A thorough analysis of different alternative solutions to agrarian crisis (ecological crisis + economic crisis – both at global & local levels) has revealed that agro-ecology is at the heart of sustainable farming systems. Hence farmers need to understand the science of agro ecological bases of sustainable agricultural practices. Agroecology is therefore increasingly recognized as the way forward for sustainable agriculture, capable of delivering productivity goals without depleting the environment and disempowering communities. Agroecology, which uses ecological concepts and principles for the design and management of sustainable agricultural systems, has consistently proven capable of sustainably increasing the total output of diversified farms and has far greater potential for fighting hunger, particularly during economically and climatically uncertain times.

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