Synergetic Agriculture System & Development

by
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CERTIFICATE

This is to certify that the thesis entitled "Synergetic Agriculture system & Development" being submitted by Mr. Ran Singh Arya to the Indian Institute of Technology, New Delhi for the award of the degree of Doctor of Philosophy is a record of bonafide research work carried out by him. Mr. Ran Singh Arya worked under our guidance and supervision and has fulfilled the requirements for the submission of this thesis, which to our knowledge has reached the required standard. The results contained in this thesis have not been submitted in part or in full to any other university or institute for the award of any degree or diploma.

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ABSTRACT

Around a century of energy intensive modern agriculture practices based on mechanization, chemical fertilizer, pesticides, hybrid seeds etc. dominated by the basic idea of "Mastery over the Nature" has brought the humanity at the brink of destruction. The ill-effect of modern farming on environment, land, water resource and human health has become acute. Agriculture is now the largest non-point source of water pollution. Problems of pesticides and antibiotic residues in food remains unresolved.

This situation of crisis has forced us to rethink over these so-called developmental processes. Club of Rome's Report- namely, Limits to Growth marked the beginning of this concern. Much talked about conference of Rio-de-jeneiro in 1992 on environmental problems was an outcome of this. This tendency to search for alternatives found expression in the form of Sustainable Agriculture, Organic and Natural Farming, Permaculture, Biodynamic farming, Ecological Agriculture, Alternative Agriculture etc.

It is now clear that seeking for alternatives to the modern practices of agriculture within the same paradigm is in vain as the very concept of modern development, of which the modern farming is just an expression, is basically unsustainable. Agriculture being not only an industry but a way of life, goes hand in hand with the world-view , the knowledge system that supports it. A need for an alternative world-view was clearly felt therefore.

A right perception, a world view that explains the man, nature and their interrelation in a mutually satisfying manner is the need of the time. Sah-Astitwa Principle (SAP) based on a deep experience of existence, provides such a world view. Sah-Astitwa means every unit is related to the other in a mutually fulfilling manner. Sah-Astitwa therefore is a guiding principle to work and evolve in complementary togetherness providing a perfect harmony within and in all relationship. It relates one with the entire natural order in a meaningful manner.

Thus, the objectives of the present study has been defined as:

1. *To develop right (Synergetic) agriculture system and the world view to provide foundation for it.*

2. *To work out the guidelines for this alternative practice- "Avartanshil" agriculture based on sah-astitwa principle.*
3. *To study the feasibility and the practicability of this new system in a cluster of villages in Western U.P.*

This thesis entitled "Synergetic Agriculture System and Development" (organised in 9 chapters), with the above in view, starting from an overview of the existing state of modern farming and its problems, looks into the alternative practices being experimented upon. It, then, goes on to investigate the world-views, the concepts of development underlying these practices. The new world view SAP has been studied in the context of agriculture. An alternative agriculture system in the light of this world view has been worked out.

Considering the limits of time and scope, attention has been focused on two important aspects of farming - seed and plant nutrient management. This work has been carried out keeping in view a selected village cluster in Western Uttar Pradesh, a famous Green Revolution belt. The author coming from a farmer family in this area, has a broad base and strong linkages with farming community. This proved very useful in understanding the ground realities, an important aspect to be considered for developing suitable alternatives. Further, it was planned that work should range from research and development, field-testing to technology transfer, policy and planning for its propagation, so as to cover all the important aspects of the agriculture system.

For understanding the operational aspects of newly developed agriculture system, experimental work on two systems viz indigenous seed- organic manure (system A) and HYV chemical fertilizer (system B) was carried out for 5 consecutive years under controlled conditions at Micromodel , I.I.T., Delhi. Statistical analysis of the results obtained indicates the strong viability of new system based on indigenous seed in view of its capability not only at the energy, ecological and environmental front, inherent in the system but also at the level of productivity. Results of field testing carried out with selected farmers in Palri village for 3 consecutive years confirms this revealing aspect. Further about 20% water required for irrigation can be easilyconserved in the new system. Detailed economic analysis of both the systems reveal very interesting results in favor of new system.

In the context of organic manure production and utilization, three new designs of composting, an improved method of heap manure and a new method of biogas slurry treatment, all based on NADEP principles have been developed. Among these, PALRI METHOD seems to be a major break through. Unlike original NADEP, it requires no water during the entire process including maintenance. Detailed techno-economic analysis of these techniques reveals that though PALRI METHOD gives economic returns comparable to biogas technology in terms of NPK availability, yet biogas system would prove more popular in view of providing gas for cooking in addition to slurry. Further, Biogas technology incorporating new method of slurry treatment would undoubtedly prove a boon to synergetic agriculture system. However, in a situation of low capital investment capacity of the farmers, other composting systems would be more viable. An integration of all these would offer an optimal solution.

Efforts have been made to popularise these results of importance by information dissemination through publishing booklets and telefilm in all regional languages. Overall impact of the experimental findings and field testing results could be felt even at the national policy level for popularisation of organic farming.

Serious thought has been given to planning aspects for newly developed agriculture system embracing a new world view. Policy issues in the context of agriculture, are briefly presented. These will provide a starting point. An extensive effort including all aspects of planning as discussed in the thesis will be called for in order to get a long term and permanent solution to human problems. Finally, it is concluded that productivity and economy are important but mere profit or production can not be the motive. These have meaning only in the context of the ultimate aim of all human activities i.e. realization of happiness, peace, contentment and bliss individually through orgaisation within oneself (Swamushaan) and intelligibility, prosperity, fearlessness and coexistence collectively through the realisation of organisation of system at all levels (Swarajya).

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