2 STRENGTHENING THE ECOLOGICAL FOUNDATIONS FOR SUSTAINABLE AGRICULTURE

MESSAGE OF HOPE

Sustainable agriculture & Ten Guntha experiment……

The Ten Guntha Experiment (TGE) is a model of alternative livelihoods-oriented, sustainable agriculture based on organic farming and LEISA. Mr. Balkrishna Renke, from the Denotified Nomadic Tribes, left his job and bought 25 acres of totally degraded land from which the topsoil had already been removed for brick-making in Solapur district, whose average annual rainfall is less than 600 mm. By using ample biomass waste, available locally and from Solapur town, Mr. Renke has achieved productivity levels close to the scientific postulations on limits to productivity. To a group of 5 women – his wife and 4 others, of whom 2 were illiterate, 2 neo literate – he gave two plots of 10 gunthas each. The group decided what to grow. A ‘Livelihood Basket’ including fruit and fodder, cereals, pulses, vegetables, spices, medicinal plants etc. was grown. A large amount of biomass from the grass on ‘wasteland’, fresh and composted leaves, weeds from farms, crop wastes and gliricidia and other green manure crops, along with an average of 2000 to 2500 litres of water per day from a nearby well, minimal equipment and financial support, training and motivation for the first 2 years till crop yields stabilized, resulted in an average yield at market prices of Rs 36000 p.a. (excluding the hedge) in the 2nd and 3rd year – or a net surplus of Rs. 13,000 p.a. after meeting household needs. The trees are expected to contribute a further Rs 5000 p.a. after stabilisation of yields in the 5th year.

The 10 guntha experiment is currently being undertaken in several places extending from Konkan to Vidarbha.

2.1 Maintaining the productivity of the asset base of agriculture through safeguarding the fertility of soil, adequate and timely access to water, preserving biodiversity and promoting agro-diversity are essential for sustainable agriculture. The asset base is destroyed not only through unwise physical interventions, but through biotic pressure from the rural poor and over-consumption by a minority - hence equity in use of these natural resources is a precondition to sustainability, and eventually to stability. Unless there are conscious state interventions in all sectoral allocations to ensure that equity considerations and not merely technical parameters - are incorporated in action plans, the ecological foundations for sustainable agriculture cannot be preserved. Farmers’ well being requires ecological and livelihood security for the rural masses. Globally the Right to Food and the Right to Water for all are increasingly recognized as requiring precedence at the state level over all other ‘development’ programmes.
ICAR Vision 2000 states: “Limited scope for horizontal expansion and need for increased crop intensity and productivity dictate sustainability of agricultural production through judicious exploitation of agro-bio-diversity. Hence germplasm collection, conservation, optimum utilization, and germplasm enhancement have to receive greater attention.” Community stake through village/panchayat level Agro-diversity Registers and rewards to communities preserving agro-diversity is therefore essential. Fortunately opportunities are available for this purpose under the already enacted Protection of Plant Varieties and Farmers’ Rights Act and Biodiversity Act.

Local varieties of crops and livestock are generally disease and stress resistant. Traditional integration of agriculture and livestock, multi-crop farming systems etc provide insurance to farmers from failure or glut of mono-cropping systems, and balanced/nutritious foods for humans and livestock. Natural pest control and organic fertilizers maintain soil and water quality and reduce farmer indebtedness. Globalization and commercialization of economy may hasten the process of mono cropping and spread of High External Input Varieties of a few major food and cash crops and animal species, resulting in the replacement of the traditional indigenous germplasm and ecologically/nutritionally sound farming systems. Erosion of agro-bio-diversity, loss of traditional knowledge and high indebtedness for the farmer and the state will consequently occur. Therefore, an action plan through an Agro-ecology and Livelihood Mission is proposed to conserve bio-diversity and agro-diversity and provide livelihood security to all sections of the rural community. (See Para 2.22 below).

Conservation of biodiversity, bio-prospecting of wild species and valuable germplasm for bio-molecules, and genes for commercialization need to be documented at village/panchayat levels as per requirements of Biodiversity Act. The Plant Variety Protection and Farmers’ Rights Act should ensure similar village/panchayat level records for agrodiversity. Similar legislation is also required for livestock diversity. DNA fingerprinting is needed to establish ownership of indigenous materials, and IPR issues will have to receive priority to prevent misappropriation at all levels.

Natural Resource Management Systems with comprehensive land use and water systems planning, biodiversity conservation, forestry, agriculture, horticulture, livestock, aquaculture etc based on cross-functional and multi-level integration are essential for optimal use of the State’s natural resources. Community level Participatory Resource Mapping, combined with scientific inputs such as GIS and administrative integration at all levels, is needed for Resource Use Planning (integrating Land & Water Use Planning with Biodiversity Conservation). The proposed Agro-Ecology & Sustainable Livelihood Mission can work to promote this concept.
2.6 State should prevent soil erosion on hill slopes and improve hydrological cycles by involving communities, especially those on hill-slopes, in protecting and regenerating natural biodiversity in a way that meets local livelihood needs. Where biodiversity is already lost, agro-forestry and pasture management to meet Food-Fodder-Fuel needs of local communities can be promoted. Such activities can be undertaken under Food for Work and Employment Guarantee programmes.

2.7 State should avoid large scale interference with natural river flow and large scale use of exogenous water for monoculture, should sustain natural cycles, and should avoid depletion of ground water and degradation of soil and water from high input (water, energy, chemical pesticides and fertilizer) agriculture.

2.8 State should make floodplains and spill areas/basins accessible for the overflows of rivers, and reintroduce diversion canals with appropriate regulatory mechanisms and community involvement, to restore soil fertility and biodiversity.

2.9 State should stop cultivated farming on sloping upper catchment areas and marginal lands; it should be replaced by suitable local & traditional varieties (grass, fruit trees, etc.) that can alternatively sustain the communities. This should be in accordance with land capability criteria and agro-ecological zoning. Special emphasis should be given to appropriate pasture management practices, improving forage production, soil health maintenance and natural resource conservation.

2.10 State should take a policy decision in accordance with the ICAR Vision 2000 and make a policy shift and strategic switchover from crops requiring excessive water i.e. from Unsustainable High Energy & External Input Agriculture (UNSHEIA) to a Low External Input Sustainable Agriculture (LEISA) pattern by reverting to more of traditional cultivars and farmer-oriented practices. State should optimize irrigation to minimum necessary levels to maximum area and maximum number of farmers.

2.11 State should phase out crops and varieties requiring unsustainable use of water. This will not only preclude drainage and water logging problems in irrigated areas, but bring to optimum productivity the 85% rainfed areas by giving access to at least the minimum essential water to the maximum area and farmers. Minimum necessary protective water made available to maximum possible area and maximum number of farmers will result in higher aggregate production for the State than focusing on increasing yields with high inputs to limited areas.

2.12 Genetically Modified (GM) plants/animals are receiving increasing scientific and consumer concern world-wide due to apprehensions of adverse impacts not only on human health but also on natural biodiversity, agro-diversity, soil microbiota, and livestock. GM strains should not be introduced without rigorous testing, public disclosures and debate, farmer evaluation and independent monitoring and control being assured by the State.
2.13 Action plan for phasing out of harmful pesticides and replacing these with traditional bio-pesticides and integrated pest control practices, needs to be urgently worked out and implemented by the state. Depletion of fossil fuel reserves, global trends and consumer and farmer well-being requires planned rapid transition to environmentally sustainable farming practices.

2.14 Departments for Ecologically Sustainable Agriculture - including Organic Farming & LEISA should be set up in all SAUs. These departments and KVKs should be geared up to provide effective capability building through education, training and support services at the work places. Natural Resource Management Systems based agriculture, integrating watershed and wasteland development, agroforestry, livestock management etc. within a framework of conservation of natural biodiversity, is a top priority for sustainable agriculture and should get reflected in the State’s agriculture curriculum, research, education and training at all levels.

2.15 State should rediscover its vast heritage of indigenous seeds and preserve and propagate them through “Field Gene Banks” and “Seed Banks”. As in the case of biodiversity conservation rewards, the National Gene Fund proposed under the Plant Variety Protection & Farmers Rights Act should be used to support rural communities/individuals who act as primary conservers by sacrificing personal gains for public good by cultivating traditional crops to maintain the genetic stock. Bio diversity Fund could also be used to support the local cultivators to revitalize their in situ on-farm conservation traditions. Seed Banks should ensure adequate choice for resource poor farmers who need to take into account not only yield per
hectare but their capacity for cash input and risk taking. By taking up programmes for increasing biomass availability and preserving and propagating good indigenous seeds, the State could thereby also switch to low-input agriculture and reduce input costs and increase the use of traditional varieties better adopted to high risks marginal environments.

2.16 State should take measures to stop, phased over 5 years, all financial support which promote destructive / wasteful use of resources. Some of these subsidies promote wasteful resource use, depletion of ground water, increased use of toxic chemicals, loss of soil fertility and water purity and agro-bio-diversity. These financial resources should be redeployed to promote sustainable agriculture/livelihoods. Conservation of water and energy through differential tariff rates should be introduced at the earliest.

2.17 State should actively study the successful Organic Farming taking place in the State and elsewhere, and devise strategies for expanding this by providing support to labour and skill intensive biomass development, compost and vermi-compost production at village level, preservation of indigenous seeds, small scale irrigation and non-chemical pest control systems. State should facilitate easy access to international certification of organic products to enable farmers to realise high prices both in national and international markets, support farmers through banks for bio-mass based dispersed industries, provide access to research and credit for agriculture, horticulture, livestock and processing.

2.18 State should redeploy irrigation resources to promote wider dispersal and equitable benefits from existing large projects and more actively promote small scale irrigation by integrating it with watershed development and with programmes for revival of traditional Water Harvesting Systems in villages. Equity in access to water and protective entitlements to the poorest sections should be a precondition in planning and execution of all publicly funded schemes.

2.19 To introduce an environmentally conscious mind-set at every level, suitable incentives and/or network for marketing traditional crops and produce based on biodiversity and sustainable agricultural practices such as Organic Farming and LEISA should be introduced. To begin with, state should initiate action for awareness creation in agricultural universities, in related departments, at all levels of decision makers and in the general public, an awareness and respect for the richness of traditional organic agricultural practices and of the importance of conserving natural biodiversity, agro and livestock diversity.

2.20 State should take steps to shift current systems of measuring agricultural productivity from single species yield measurement to valuation of the total productivity, in terms of crop, fish and useful plants. Farmers in Maharashtra who have shifted to systematic Organic Farming of cotton, grapes, banana etc are stating that they have higher net yields, improved nutrition and health
and greater diversity and sustainability. Their results need careful study and evaluations.

2.21 State should establish rural PDS based on procurement and price support to a wide range of local cereals and millets, which are nutritious (jowar, bajra etc), provide valuable fodder from residues, and thereby support the state’s resource poor farmers.

2.22 Integrating all the above plans of action into one cohesive action plan for sustainable agriculture requires that the State develops an integrated plan for Agro-Ecological and Livelihood Security to ensure that the ecological asset base essential for Sustainable Agriculture is not destroyed through the survival compulsions of the landless and impoverished sections of society for which some of the successful experiments could be replicated by the state in a big way. (ref. box)

2.23 For the broad based recommendations to be converted into a detailed Action Plan, a Task Force with certain broad objectives should be set up to further work on the details of an Action Plan. A Mission for Ecology and Sustainable Livelihood can work in an action mode to fine tune and implement the Action Plan.

2.24 Since the capacity of ecosystems to support populations is limited, and is already breaking down under human population pressures, Maharashtra needs to make a demographic transition to low birth and low death rates as soon as possible. If human population continues to grow at unsustainable levels, sustainable agriculture will not be easy.