

Policy Needs for Sustainable Crop Management for Achieving Net Zero Emissions

Venkateswarlu B

Former Vice Chancellor, VN Maratwada Agriculture, Parbhani
Corresponding author email : vbandi_1953@yahoo.com

With increasing concerns on the sustainability of the modern agriculture practices, alternative approaches to crop production are emerging based on the principle of agroecology. These approaches aim to achieve higher output with less use of water, energy, nutrients and capital. Sustainable Crop Intensification (SCI) is one such approach practised by small holders in India and few other developing countries largely due to the efforts of NGOs. Success stories of small farmers adopting such practices and achieving higher yields economic gains are well documented both from India and other developing countries. In India, we see some Government Support to these approaches in terms of policy and financial incentives in states like Bihar. Related with this approach are Conservation Agriculture(CA), Agroforestry, Integrated Farming systems, IPM etc which are also supported and researched by main stream scientific community.

While conceptually, these practices are considered nature friendly, less capital, energy intensive and climate resilient, in practice farmers face many difficulties and even Governments find it difficult to upscale them to larger areas. Some of these constraints are technological and others are policy related. The major weakness is the lack of adequate and continued research support for SCI. Since it is more knowledge and skill intensive rather than input driven, continuous training and capacity building of farmers are required to sustain and increase the adoption. There are other issues related to high labour dependency, water management, handling machinery and tools etc which need to be overcome.

In addition to being less resource demanding and nature friendly, SCI is claimed to help in climate resilience. Crops grown under SCI can adapt to adverse climatic events in a better way due to improved root system, and more importantly, they emit less greenhouse gasses. There are many reports of reduced methane emissions with aerobic rice, AWD, SRI but the data on N₂O are conflicting. Very little work is done on emissions from other crops like sugarcane,

wheat, maize, mustard, pulses and vegetables where SCI is promoted. India has committed for Net Zero Emissions by 2070 at the Paris agreement. Though agriculture is not part of this commitment, India cannot achieve net zero without reducing emissions from Agriculture. There is an urgent need to generate data on emission reductions linked to SCI in all these crops both directly due to improved water and nutrient management and indirectly due to reduced energy use and recycling of crop residues to have a clear understanding of the contribution of SCI towards emission reduction in Agriculture sector.

The Current policy frame work in the country has evolved to promote input intensive agriculture. Subsidies on fertilizers, free power and water in many states counter the very objective of resource use efficiency. The efforts to promote eco region specific cropping systems has also not succeeded so far. Rainfed Agriculture which covers 50% of the net sown area has not received adequate attention while planning and resource allocation. The most cited constraints in adoption of SCI are high labour requirement, more drudgery, lack of appropriate machinery for certain specific operations and operational difficulties in water, nutrient and weed management. The yield advantages are not established in all the crops despite increase in labour costs. There is an urgent need to revisit the existing policy and incentive structure in agriculture. Some suggested steps to promote SCI include;

1. Not all areas and crops may be suitable to adopt SCI. As a first step we need to identify and map areas and crops, where SCI can be promoted based on climate, soils, water management systems and the results from on station and on farm experiments. This needs to be done by the states with guidelines from the centre.
2. Include some of the high labour intensive operations in the MGNREGS shelf of works even if they are done on individual farmers' fields. It can be restricted to small and marginal farmers to begin with. The list



-
- of operations can be finalized through a national consultation.
3. Promote small farm mechanization appropriate for SCI, custom hiring centres through FPOs and reduce dependence on large machinery which need more fuel and cause more emissions
 4. Support research on agro ecology and regenerative agriculture both in Public and private institutions. Institute a mechanism to learn from the field experiences of the Non-Government Organizations(NGOs)
 5. Continued emphasis on capacity building and training of farmers. Dedicated budget line to be provided in each state for farmers training and exposure visits to successful farmers' fields practicing SCI and research stations/KVKs.
 6. Carbon finance projects are just picking up in India with few successful projects already approved in the areas of water shed management, agroforestry, natural/organic farming, conservation agriculture etc. Government of India to come out with a policy on carbon markets in agriculture with in the country and payment for ecosystem services