



GCARD

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Context – the problems being addressed

The current and future food security of South Asian countries has twin challenges of resource fatigue and decelerating productivity growth of food grain crops. These challenges are being further exacerbated with the sharp rise in the cost of food and energy, depleting water resources, vulnerability of soil to degradation, indiscriminate and imbalanced use of external production inputs and overarching effects of changing climates. This has and will further lead to lower farm profits, making farming unattractive and unsustainable.

This notwithstanding, South Asia accounts for less than two percent of the world's total land area and contributes 14 percent acreage of the global agricultural land. However, about 94 percent of the agriculturally suitable area is already under cultivation with almost no scope for further horizontal expansion of agriculture. The ground water depletion in most productive north-western Indo-Gangetic plains (the 'food bowl' of the region) has been at an alarming rate and is a major issue of concern. The current food crisis caused by a dramatic increase in world food prices, led to political and economical instability and social unrest in both poor and developed nations.

There has been a tremendous shift in the production variables of modern farming over traditional plough-based farming. Even then, the most agronomic works revolved around tillage and labour intensive farming. Declining soil organic carbon (SOC) status of soils has been main shift in agriculture from 'traditional animal based subsistence' to 'intensive chemical and tractor based' agriculture that multiplied problems associated with sustainability of natural resources. Large acreage of cultivated lands shows fertility fatigue and deficiency of multiple nutrients in many intensively cropped areas. This adds to our challenge of making farming more profitable.

For food and livelihood security in the region, four major areas *natural resources, climate change, water and food* have found priority which brings to fore the need for fresh infusion of new technologies to tap new sources of productivity growth. Hence, urgent changes are required in agricultural research for development (AR4D) systems, to address goals of reducing hunger and poverty, while ensuring environmental sustainability and meeting the needs of resource-poor farmers and consumers and puts major thrust on "innovations for greater impacts on smallholder farmers".

The efficiency and sustainability of a production system depends on system-based management optimization of crop yields, economic benefits, and environmental impacts. Conservation Agriculture (CA) based crop management practices that include three key elements of (i) minimal soil disturbance, (ii) rational soil cover (residues, cover crops) and (iii) judicious choice of *crop rotations* have proven to help in efficiency and sustainability of production systems. To achieve this paradigm shift in AR4D, the think tanks of AR4D in national agricultural research systems (NARS), CGIAR centres, IARCs, FAO, ARIs, private sector and NGOs have accepted conservation agriculture (CA) as a vehicle for this paradigm shift. Conservation agriculture (CA)-based crop management practices have proved to produce more at less cost, inputs on a sustainable basis and reduce environmental footprints.

Like any other technologies, it may not be a panacea for all present day ills, but has proven to bring out South American agriculture out of its stagnant state almost 20 years ago, skyrocketing the cereals and oilseed production system. Same is the case for regional CA networks in different continents/sub-continent. Conservation agriculture (CA) is being widely accepted as an important component of the overall strategy for enhancing productivity, improving environmental quality and preserving natural resources for food security and poverty alleviation in such areas. Thus, for addressing the issues of resource fatigue and bridging '*management yield gaps*', in South Asia, CA-based management solutions are cornerstone.

Current activities presented and discussed in the Session

During early 1990s, the rice-wheat cropping systems (RWCS) of the Indo-Gangetic Plains (IGP) of South Asia (13.5 M/ha), the major food security system in the region have started signs of stagnating productivity growth, declining factor productivity, emerging soil health issues, declining water tables, resistance of herbicide resistance in *Phalaris minor*, etc and had put a threat on RWCS.

Realizing the importance of these issues not only at national level but also at regional level, the regional NARS (Bangladesh, India, Nepal and Pakistan), CGIAR centres and the key donors together launched a common regional platform as *Rice-Wheat Consortium for the Indo-Gangetic Plains* (RWC) in May 1994 which is led by NARS and facilitated by CGIAR centres in the region. The RWC acted as catalysing platform to promote the technologies to address the key challenges of RWCS in the region. Conservation Agriculture based crop management technologies initiated and promoted by RWC led to a steady rise in the acreage of CA based resource conserving technologies in the region. RWC reported a total coverage of nearly three metres ha under CA based resource conserving technologies in South Asia by 2007 benefiting hundreds of thousand farmers directly to the extent of nearly US\$ 150 million. This has been possible through regional learnings and information sharing for development of feather weight, low cost multi-crop ferti-seed planters through building capacity of local manufacturers. Laser land levelling in the region in general and India in particular is another mega success story of the RWC. An independent study by IFPRI on impact of the CGIAR research have reported that RWC facilitated CA program has saved US\$164 million with an investment of only US\$ 3.5 million with internal rate of return of 66 percent highest amongst all the CG program.

Recognizing the significant efforts made in the region, the RWC was awarded the prestigious 'Kind Bedouin' and CGIAR excellence awards. Though NARS have initiated several programs with good investments, the most important mechanism that is needed to have in place is the common platform for sharing knowledge through cross learnings across the production systems, agro-ecologies and borders in the region like RWC. NARS leaders repeatedly emphasized that RWC has made tremendous contributions for introduction and promoting conservation agriculture in the region. There is a need to revive and strengthen RWC to provide a common neutral platform for policy makers, R&D managers, researchers, private sector representatives, NGOs, CGIAR institutions, CSOs and the farmers to assess local/national and regional needs, exchange information, and accordingly define priorities for the deployment of CA with a focus on small holder resource poor farmers.

Intended outcomes

- RWC revived and strengthen as a common neutral platform for policy makers, R&D managers, researchers, private sector representatives, NGOs, CGIAR institutions and the farmers in South Asia to exchange information, and define national/regional priorities for the promotion of CA so as to ensure faster impact on small holder resource poor farmers.
- Generated new scientists and change agents in frontier areas of CA through capacity enhancement
- Smallholders farmers have easy access to region-specific technologies with good human resources at ground and suitable policy support for large scale adoption

Commitments to collective actions in 2012-2014 (national, regional or international)

i. With existing resources

- Investments by the national governments are not an issue as they are making investments under different schemes and hence prioritization and making best use of the allocated resources for accelerated adoption of CA in the region;
- The CA has been accepted and adopted by the large number of smallholders in the region (at

least 10 M/ha).

ii. Immediate gaps to be filled

1. Revive RWC to have a neutral common platform in South Asia;
2. Creation of regional CA networks;
3. Greater adoption and impact of CA will have to come from non rice-wheat systems and rainfed ecologies, an area which is untapped so far in the region;
4. Efforts to capture farmer innovations on CA and align them with scientific validation and refinements;
5. Analytic and communication tools need to be developed to help policy makers understand economic, social and political implications of CA-based technologies vis-à-vis existing farmers' practices;
6. CA is relatively knowledge intensive system. Hence, multi-disciplinary, multi-stakeholder partnerships should be developed and strengthened for further fine tuning the CA based technologies;
7. Innovation systems including ICTs for real time access to information;
8. Mechanism for technical back-up support to farmers and service providers;
9. Mechanism for capacity building at different levels and scales;
10. Effective database capturing and management mechanism to policy decisions;
11. Incentives for CA adopters (carbon credits etc);
12. Mechanism for establishing minimum quality standards for CA machinery;
13. Establish single window services-farmer cooperatives;
14. Subsidized quality CA machinery.

iii. With specific large scale programme investment

- Investments by the national Govts on CA
- CGIAR Research Programs investments for greater impact