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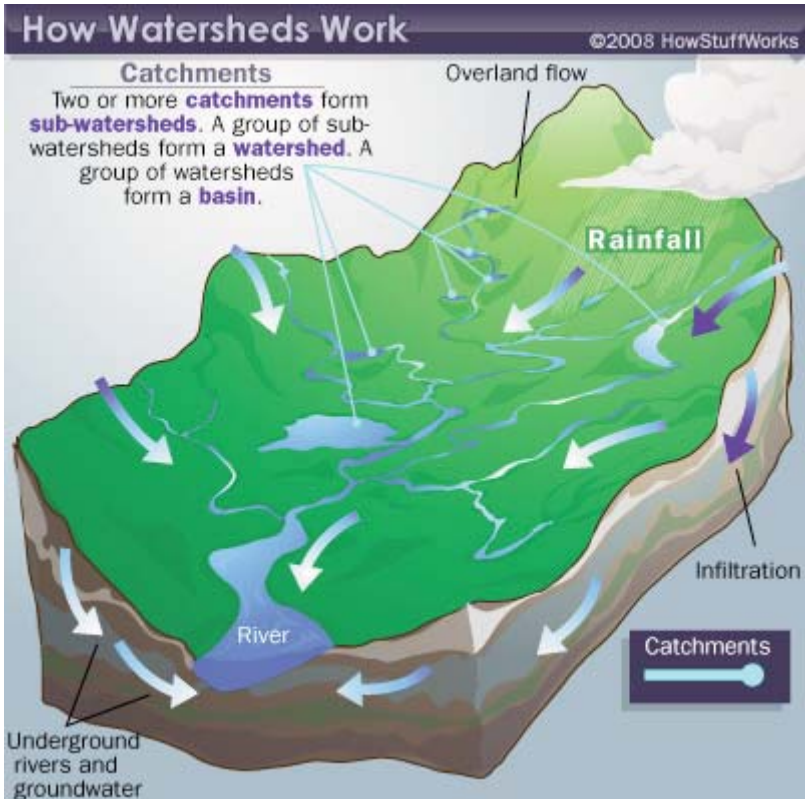
Conservation Agriculture newsletter

Getting Agriculture to Work for People and the Environment

Conservation Agriculture and Watershed Development - A Strong Case For Induction

Dr. I.P. Abrol, Professional Alliance for Conservation Agriculture

Attention is being increasingly given to opportunities of raising crop productivity in rainfed areas and these are being accompanied by valid concerns. There is recognition that continued reliance on "irrigation + high yielding variety seeds + fertilizers" strategy alone will not be adequate to satisfy India's need for sustained and substantial output increase for basic food and agricultural commodities. Concerns of regional and social equity further reinforce the need for improving the lot of farmers and rural labour in rainfed areas that account for some 60 percent of India's net cultivated area, 40 percent of human, and 60 percent of livestock population. Rainfed areas also contribute nearly 40 percent to food grain production, 78 percent of maize, and almost all pearl millet grown in the country. Further, 75 percent of all oilseeds, 87 percent of pulses, 65 percent of cotton and 80 percent of horticultural crops are contributed to by rainfed regions.



Schematic diagram of a typical watershed
Source: http://science.howstuffworks.com/watershed1.htm

Agricultural GDP growth has decelerated from over 3.5 percent during 1981-1997 to 2 percent during 1997-2005, with rainfed areas being most affected. This is way below targets set for the 9th and 10th Plan, and given the situation, it is a major source of concern. If prospective deficits are to be met from domestic production, a massive thrust will be needed to raise productivity of un-irrigated agriculture rapidly and sustainably, that would critically hinge upon:

(a) Improving the production environment for farmers in areas where irrigation is not available or not likely to be available in foreseeable future for technical or financial reasons

(b) Identifying, verifying, and disseminating suitable soil and water conservation, and crop production technologies for rainfed areas.

Watershed Management

Since early '80s, watershed approach based projects have increasingly come to represent the principal vehicle for improving rainfed agriculture in the country. The term 'watershed' refers to a geographic area that drains to a common point making it an attractive planning unit for coordinated multi-disciplinary efforts. A watershed also represents an area that contains socio-economic administrative boundaries, and covers land that falls under different property regimes, with participating farmers being stakeholders whose action may affect others' interest.

As such, planning and implementation within the framework of the natural unit of watershed is aimed at stabilizing and improving the agro-environmental resource condition, both on and off-farm under which farmers in rainfed areas operate. Its ultimate objective is to facilitate widespread adoption of improved on-farm technology for substantial increase in farm productivity and income gain.

Using watershed as a planning and implementation unit, past projects have focused on economically viable activity to improve

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agricultural resource environment. These have emphasised on soil and water conservation, water storage, irrigation development, dryland farming practices, and rehabilitation of non-arable land, to name few important initiatives.

As such, watershed management projects have become the primary vehicle for improved land and water management activity in the country, based on experience gained from several pilot level projects in the eighties, including ICAR, model watershed studies, and other success stories. These initial efforts paved a way for National Watershed Development Project for Rainfed Areas (NWDPRA) launched in 1990-1991 and these efforts have been further strengthened over time.

Lessons Learnt

Lessons learnt from past efforts to improve rainfed agriculture by adopting integrated watershed approach can be broadly grouped into those on account of, (i) design and implementation and, (ii) technological interventions

Design and Implementation:

Analysis of strengths and weakness of projects implemented permits us to establish few principles for guiding future policy in execution of projects (Planning Commission 2008):

- Need for operational flexibility to suit varying local conditions through decentralized decision making
- Watershed projects should be considered as instruments for achieving increased land productivity in an inclusive manner, with particular reference to equity
- Centrality of community participation through local institutions in project planning and implementation
- Need for intensive facilitation by way of social mobilization, community organization, building capacity of communities in planning and implementation, ensuring equity, etc.
- Effective institutionalization of monitoring, evaluation, and learning processes
- Effective involvement of key stakeholders and their capacity building through institutional arrangement

These and other lessons are being internalized to improve the efficiency and effectiveness of projects in next generation watershed projects being taken up.

Technological Efforts:

The main objective of watershed based efforts is to improve productivity of rainfed areas through wide scale adoption of appropriate soil and water conservation measures and reversing the processes that contribute to resource degradation. Resource degradation problems as reflected in large volumes of runoff and soil erosion throughout India's watersheds are at the core of any strategy aimed at improving rainfed agriculture.

There is ample evidence from experimental station research and under actual farming conditions to show that agricultural practices that facilitate and promote in-situ conservation of rainfall, constitute the most effective way to improve productivity of rainfed crops. Adequate moisture in the soil, proper fertilizer dosages and application, proper placement of improved seeds, and crop management practices can result in substantial yield increase given the strong synergistic interaction between these factors as has been demonstrated under different situations through ICAR pilot project efforts in mid eighties. Productivity increases up to 200 to 300 percent over base yields were frequently reported from these efforts.

Recommendations for in-situ moisture conservation in rainfed areas have been limited, and promoted half-heartedly. The main recommendations for in-situ conservation have included early (or off-season) ploughing and harrowing to facilitate creation of 'soil mulch' and ploughing across the slope. More specific recommendations for different soil and rainfall conditions will involve various techniques to modify the surface configuration of land. Examples include dead furrows at 3-6 m intervals for low rainfall red soil areas and medium rainfall black soils; sowing on flat land with subsequent ridging, cultivation on red soils with medium rainfall, deep ploughing on red soil with dense subsoil, and graded border strips in high rainfall red soil areas.

Contour cultivation as a practice to conserve soil moisture

There are a number of other soil management techniques that have been developed and recommended to improve cropping prospects on different soils in various agro-climatic regions. These include practices such as 'raised bed/sunken bed' technology for fine textured slowly permeable soils in regions receiving more than 1000 mm rainfall; ridge technology for slowly permeable soils with slopes up to 1.5% receiving more than 1000 mm rainfall; 'seedling mulch technology' for pearl millet and cotton cultivation on soils susceptible to crust formation, etc. The 'broad bed and furrow' technology developed by ICRISAT facilitated double cropping on deep black soils with gentle slopes up to 3% in areas with assured medium to high rainfall and where water holding capacity of soil was sufficient to produce two crops per year without irrigation but where drainage is a problem and interferes with tillage operations. Although many of the recommended practices and technologies can increase yield and farm income, farmer adoption has not been widespread; as most technologies are not low cost, and returns not sufficiently high to persuade farmers to adopt these in a significant manner.

In principle, all tillage activities in rainfed areas should be carried along the true contour. Contour cultivation is the single most efficient and practical way to conserve soil moisture and thereby increase crop yield. On slopes of up to 6-8%, the practice virtually eliminates or significantly reduces the need for engineering works such as bunds, terraces, drainage channels, etc. The practice of contour

cultivation creates level micro-catchment throughout the field that collects and conserves moisture in-situ and reduces runoff and soil erosion. With appropriate refinement to suit specific soil and crop conditions, the practice is a prerequisite for sustained yield improvement. A further refinement of the practice is establishment of permanent true contour lines by planting suitable vegetations along selected contour lines down the slope. When a correct species is planted and established, the vegetative contour strips serve to significantly reduce runoff velocity, and filter suspended soil particles from the runoff, helping improve in-situ moisture conservation.

In the past, efforts to promote soil erosion control and water conservation have been largely promoted in isolation from an agronomic standpoint aimed at enhancing crop productivity. Strong involvement of public sector through watershed development programmes over a period of time has led to increasing isolation of soil and water conservation engineering efforts from agronomic efforts accompanied by eventual domination of engineering approaches, under the aegis of state soil and water conservation agencies. Although engineering components are intended to compliment on-farm soil and water conservation practices such as contour cultivation and vegetative barriers, in practice, government efforts have become largely limited to soil and water conservation engineering. By contrast, very little was done by way of advising farmers and promoting in-situ conservation that in fact promotes equity of sharing at the entry point itself.

Similarly, emphasis on runoff water harvesting and storage in farm pond is in a way at variance with the over-riding need to improve in-situ soil moisture retention. All soil and water conservation practices that succeed in conserving moisture in-situ will by definition reduce the flow of runoff that could be intercepted and directed to surface water storage structures. There is evidence that in many areas when appropriate in-situ conservation measures are adopted, sufficient water will not be available for harvesting in ponds, thus questioning the need to construct storage structures. Thus, if water harvesting is to be undertaken in a particular watershed, this should only be encouraged once farmers have largely adopted effective in-situ moisture conservation practices and initial efforts aimed at stabilizing natural drainage lines stand saturated.

Conservation Agriculture and Watershed Development

Recognizing that in-situ moisture conservation and reversing processes contributing to resource degradation are fundamental to achieving sustained improvements in crop productivity in rainfed areas, the concept of Conservation Agriculture offers us an opportunity to relook at our past strategies. The CA concept promotes adaptation, refinement, and adoption of agricultural practices and technologies that are rooted in three basic principles, viz.

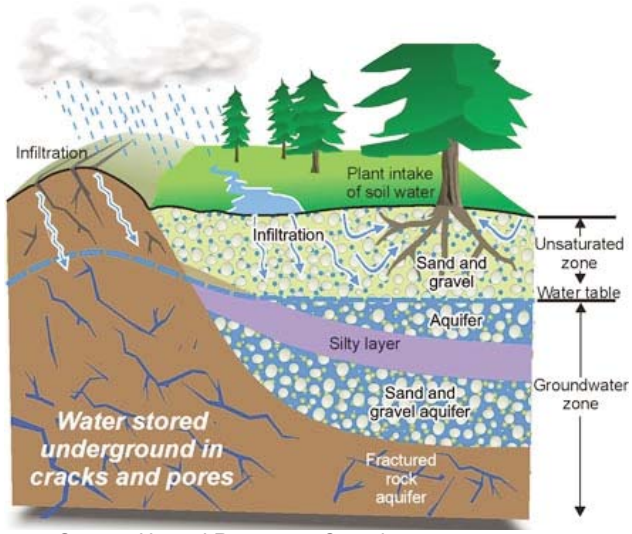
1. Causing minimum disturbance to soil through tillage and associated operations
2. Keeping the soil surface covered by leaving crop residues on the soil surface or by growing cover crops
3. Adopting crop rotations/sequencing, and encouraging agro-forestry practices

There is ample evidence worldwide to support the contention that CA based practices when adopted through an integrated approach will over a period of time contribute to enhanced productivity of rainfed crops in a sustainable manner.

Increase in crop productivity will result from:

- Improved capacity of soils to absorb rainwater and supply it to crops, reduce runoff and erosion.
- Reversing the process contributing to soil degradation and bringing about lasting improvement in soil quality through building up of organic matter and improvement in the physical, chemical, and biological properties of soil.
- Improved overall resilience of the system to periods of water stress and excess, a characteristic of rainfed areas.

CA based practices hold promise to improve rainfed cropping in a wide range of situations since they address the core factor limiting productivity in such areas, i.e. enhancing infiltration and soil water storage, and reducing runoff and erosion; while improving soil quality. Amongst India's major soil groups, medium and deep black soils with assured rainfall (about 1000 mm annual) offer an opportunity for significant and rapid productivity gains. These are the areas where improved soil and water management can permit raising two crops in a year as against only one at present. Even the single crop grown suffers from poor productivity due to management difficulties arising from low permeability of heavy soils with accompanied drainage problems. CA practices hold promise to enhance productivity of red soil areas where soil structure instability and surface sealing/crusting chiefly limit infiltration and in-situ moisture conservation.



Source: Natural Resources Canada - www.nrcan.gc.ca

Improved in-situ rainwater conservation in rainfed areas is a way to narrow the large gap between potential productivity of available crop varieties and existing crop yields. Through improved in-situ rainwater conservation, reduced runoff, and soil erosion control, the quality of surface flow improves considerably reducing the silting of water harvesting structure and prolonging their life. In any watershed based resource management strategy aimed at enhancing productivity of rainfed areas, a focus on in-situ conservation must precede other activities. Farming based on CA principles thus offer a significant opportunity to achieve the objectives of watershed development projects and forms part of PACA's focus for rainfed regions.

IV World Congress on Conservation Agriculture

Conservation Agriculture: Institutional Innovations and Policies

With this article, we end our ongoing series of overall reporting of major sessions of World Congress on Conservation Agriculture (WCCA) through this newsletter. This article highlights the papers that were deliberated on issues related to impact assessment, equity, institutional innovations & policies for CA.

Conservation agriculture is being practiced for more than three decades, given the wide range of benefits it offers. However, as with any changed process, there are many constraints; intellectual, social, financial, technical, infrastructural, and political that are bound to emerge. These constraints also present themselves as opportunities that can facilitate change as newer situations present themselves, soaring food prices and increasing environmental concern (*Friedrich & Kassam*, 2009) being prominent among them. These issues were presented and discussed at the WCCA session on Institutional Innovation and Policies.

Despite the economic, environmental, and social benefits promised by CA, adoption will not happen spontaneously. Crisis and emergency situations seem to be more frequent under the climate change scenario and would build political pressure for more sustainable use of natural resources, protection of environment, and improving food security, thus providing opportunities for supporting the adoption and spread of CA.

CA holds opportunities for climate change mitigation through carbon sequestration that can be harnessed with payment schemes for environmental services, such as carbon markets or emission reduction payments to help promote adoption of CA. It also contributes to climate change adaptation, since it is resilient to drought stress, can reduce yield variability over time, and thus improve food security.

Institutional innovations for participatory approaches for CA in Africa highlights the use of adequate level of inputs related to agricultural mechanization in African agriculture (*Kaumbuth, 2009)*. As farmers venture into CA, they need adequate exposure and training from energy utilisation standpoint in the use of equipment such as no-till direct seeders, specialized weeders, chemical applicators, and post-harvest processing equipment.

The study revealed that:

- Mechanization is one of the necessary inputs for sustained development and growth of agricultural activity. If CA is backed by innovative agricultural mechanization initiatives, it will make more power available per unit of smallholder farm land.
- The rate of adoption of CA practices in Africa can be accelerated through support of integrated processes that engage smallholder farmers directly through a three-pronged effort: (a) moving from isolated to group farming, (b) from labour-intensive to labour-saving operations, and (c) from subsistence to market-led business farming.
- To fight food insecurity and poverty, farmers must be engaged with issues concerning empowerment and business development. Farmer Field Schools (FFS) are a new way of engaging smallholder farmers in efforts that help close the gap between research and its beneficiaries. These are platforms for improving decision making capacity of farming communities and stimulating local innovation for sustainable agriculture. If used adequately, they are able to shape the agenda for extension as much as research services because of the empowering nature of approach.
- CA will not develop rapidly until and unless supported by programmes that adopt business farming with a value-chain approach. It is no longer about promoting CA but modeling it as per varying ecological, social, and economic conditions prevailing at each farming system.

Sustainable rural development through conservation of land and water resources seems a plausible solution for alleviating rural poverty and improving livelihoods of rural poor through a watershed led approach. CA is of key importance in addressing efforts of upgrading rainfed agriculture through conservation of soil and water among world's resource poor farmers. In this regard, emphasis on development, integration and dissemination of resource conservation options through community watershed approach (*Wani, et al, 2009*) in rainfed regions focuses on:

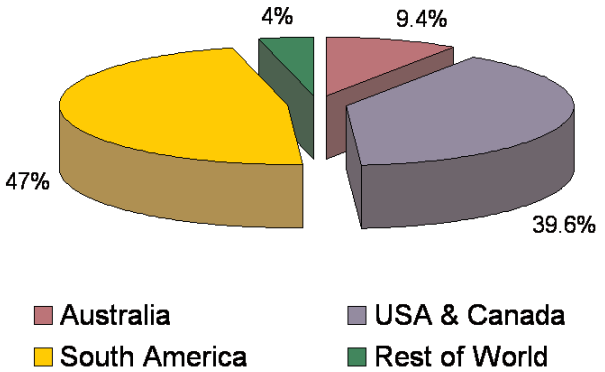
- Operationalising CA approach for improving livelihoods of rural poor by unlocking the potential of rainfed agriculture by adopting this integrated approach through watershed management.
- The new paradigm can be introduced by adopting community watershed management approach as a business model through efficient use of conserved natural resources for enhancing productivity through Integrated Genetic and Natural Resource Management (IGNRM) approach, improving community participation through capacity building, and convergence and linking of farmers to markets, thereby ensuring tangible economic benefits.
- The watershed led approach looks at various components of the rural economy, with farmers closely involved in technology development, testing and dissemination. In Asia, this approach pursues integration of knowledge and products of various research disciplines into useful extension messages for development workers that can sustain increased yields to promote income-generating and sustainable crop and livestock production options for a range of climatic and edaphic conditions.
- This approach has enabled communities to not only harness benefits of watershed management, but also achieve much of the potential from improved varieties from a wider range of crops through efficient and sustainable use of conserved natural resources.
- Capacity building has been identified as the weakest link for scaling up watershed programs, and hence, a national strategy to develop quality capacity building measures through a consortium of quality service providers with suitable quality indicators is

recommended. Capacity building of different stakeholders in various aspects of holistic watershed management is needed through consortium training institutions.

- The need for capacity building to harness off-farm employment avenues in harmony with on-farm resources will be the key to its success (*Katyal, 2009).* Lack of knowledge and skills about appropriate technology, resources, and enabling infrastructure are major impediments for adoption of modern and conservation agriculture practices to livelihood security.

Pastoral challenges and opportunities for CA focus on addressing two causal dimensions that have impeded the growth of sustainable livelihoods and landscape in the drylands through improvement of eco-system health. These underpin all production systems and help in reframing access to natural resource base (*Nori & Neely, 2009).* Dimensions include, building grazing land resilience as well as managing the livestock-cropland interface to the advantage of pastoralists and agriculturists. This can provide an important opportunity for improving relationships, efficiency, equity, and environment in drylands. The revised understanding of a range of dynamics have brought fresh elements in the analysis of pastoral societies. This has contributed to acknowledgement that pastoralists do care about conditions of natural resource base and have developed institutions suited to the local environment.

No-till Adoption in Different World Regions



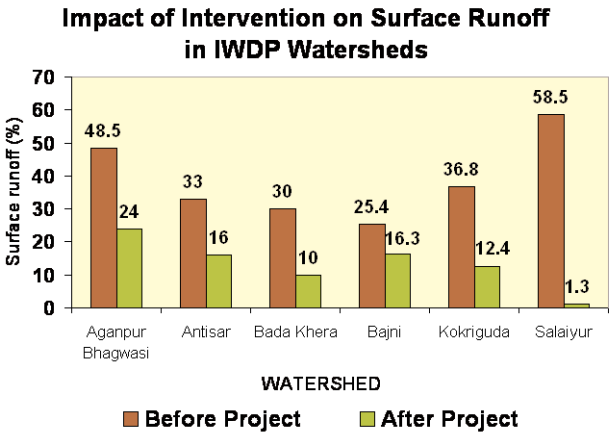
(Source, Derpsch, 2008)

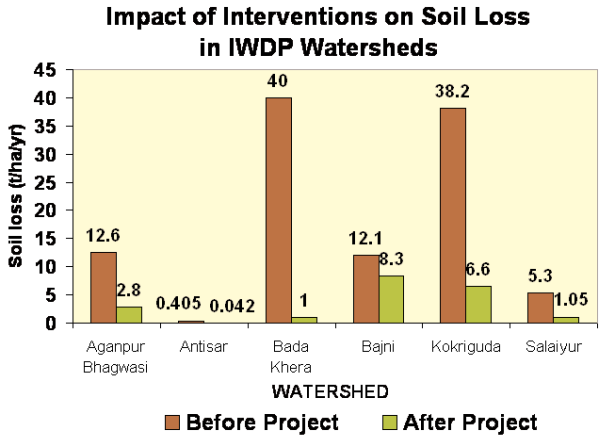
Global overview of CA adoption reveals that, with adequate policies to promote CA/No-till, it is possible to obtain economic, social and environmental sustainability, while at the same time improving soil health and increasing production (*Derpsch & Friedrich, 2009).* The need for policy action at governmental level to promote CA for environmental protection, improving the quality and supply of CA equipment, and encouraging farmers to adopt CA has been emphasized. It also stresses the need for appropriate policies and institutions to promote development and commercial manufacturing of CA equipments (Sims, Hobbs & Raj Gupta, 2009). Other institutional and policy related conclusions are:

- Decision-makers and aid agencies should focus on assisting farmers in emerging agriculture markets to jump directly from either intensive or minimum tillage to advanced Low-Disturbance-No-Tillage *(Baker & Khorishko, 2009).* The cost-effectiveness of various CA options and technology-transfer mechanisms is a crucial institutional issue.
- The acceptance of any new agricultural technology in a conservative market has always been difficult, but farmers gradually gravitate towards new technologies that demonstrate strong cost-benefits. Human resource development for converting input (resource) intensive agriculture into input (resource) efficient agriculture is a critical policy issue (*Gill & Awan, 2009).*
- Adoption and impact of CA-based resource conserving technologies in South Asia raised a number of issues and challenges in the context of rice-wheat systems of the Indo-Gangetic plains (*Erenstein, 2009).* A vast majority of farmers have adopted these technologies because they provide immediate, identifiable and demonstrable economic benefits such as reduction in production costs, and timely establishment of crops resulting in improved crop yields. However, in spite of clear benefits and adoption of RCTs, most small and medium scale farmers have difficulties in following the wider basic tenets of CA, particularly residue retention and crop rotations.
- Zero-tillage impacts so far have been primarily limited to wheat crop. Moving rice-wheat systems towards CA implies tackling challenges of reducing tillage for the subsequent rice crop, crop residue retention and diversification. Technological developments further enhance the scope of diversification, but challenges to capital and knowledge-intensive diversification options still need to be addressed. Therefore, building on the success of zero-till wheat, R & D still faces the challenge of adapting and developing sound, economic CA practices that all type of farmers can adopt year round across all cropping systems. Equity poses a final challenge and calls for better understanding of livelihoods implications and stakeholder participation.

CA offers a set of practices that may save labour and farm power. CA helps to overcome the critical peak labour demand of land preparation and weeding by planting directly into mulch or cover crops, with weed control being achieved by soil cover as well as by hand tools, and herbicides. Several Sub-Saharan Africa (SSA) studies have shown that CA saves labour and reduces drudgery for smallholder farmers. Although CA has been widely adopted in other regions, adjustments are required for it to fit with specific constraints of smallholder farmers in Africa (*Kienzle, et al)*. Even if CA has the potential to reduce drudgery and to save labour and farm power, smallholder farmers will face technical (maintaining soil cover and weed control), financial (investment in equipment), and social (free-grazing and peer pressure related to traditional customs) constraints. Lessons from widespread adoption of CA in parts of Latin America, to promote CA in Africa could be:

- The potential of CA for reducing drudgery while producing food and protecting natural resource is real. It is worthwhile to undertake efforts (institutional and financial support) to support CA systems that are adapted to smallholder farmers' real life situations in SSA.
- Common Property Resources (CPRs) constitute a substantial resource base of the rural economy and play a vital role in providing consumer goods, services and employment to the vulnerable section of the society (*Sharda & Arya, 2009).*
- CA has also been seen as an approach to help develop a





(Source: Sharda and Arya, 2009)

comprehensive strategy for improving efficiency and sustainability of India's agriculture through judicious management of common property resources (*Singh, 2009).*

- Such a strategy would help achieve goals of efficiency in terms of maximisation of net present value of agricultural production and conservation or sustainable agriculture. In India, there are many success stories of use of this kind of strategy, including watershed programmes. Institutional arrangements play an important role in managing the CPRs by creating a common forum for CPR users to come together, discuss issues concerning CPR management, identify alternative strategies for their resolution, and coordinate their actions.

Contribution of commons to CA in mountain areas such as provision of village commons or common property resources, were also discussed, especially in the fragile and marginal regions with limited and high risk crop production potential *(Jodha, 2009).* Focus on CPRs and their contribution to CA in mountain areas of Himalayas are based on inferences and understanding generated by different studies carried out by ICIMOD and its partner institutions in different locations including Bhutan, China, India, Nepal and Pakistan.

The study revealed a number of emerging trends:

- To understand the role and relevance of CPRs in CA, one has to consider specific conditions or circumstances of mountain areas termed as mountain specificities. These relate to limited accessibility, high degree of fragility, marginality, diversity and specific niche opportunities.
- While mountain specificities favour diversification of resource use and production systems, globalisation encourages selectivity and narrow specialisation. While mountain specificities call for supply condition-driven adaptations, globalisation pushes for enhanced demand-driven over-exploitation of resources including fragile lands and their selected products such as herbs.
- One of the findings was that the imperatives of

Conservation Agriculture and Soil Carbon Sequestration; Between Myth and Farmer Reality

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ABSTRACT:

Improving food security, environmental preservation and enhancing livelihood should be the main targets of the innovators of today's farming systems.

Conservation agriculture (CA), based on minimum tillage, crop residue retention and crop rotations, has been proposed as an alternative system combining benefits for the farmer with advantages for the society. This paper reviews the potential impact of CA on C sequestration by synthesizing the knowledge of carbon and nitrogen cycling in agriculture, summarizing the influence of tillage, residue management and crop rotation on soil organic carbon stocks and compiling the existing case study information.

To evaluate the C sequestration capacity of farming practices, their influence on emissions from farming activities should be considered together with their influence on soil C stocks. The largest contribution of CA to reducing emissions from farming activities is made by the reduction of tillage operations. The soil C case study results are not conclusive. In 7 of the 78 cases withheld, the soil C stock was lower in zero compared to conventional tillage, in 40 cases it was higher and in 31 of the cases there was no significant difference.

The mechanisms that govern the balance between increased or no sequestration after conversion to zero tillage are not clear, although some factors that play a role can be distinguished e.g. root development and rhizodeposits, baseline soil C content, bulk density and porosity, climate, landscape position and erosion/deposition history. Altering crop rotation can influence soil C stocks by changing quantity and quality of organic matter input.

More research is needed, especially in the tropical areas where good quantitative information is lacking. However, even if C sequestration is questionable in some areas and cropping systems, CA remains an important technology that improves soil processes, controls soil erosion and reduces tillage-related production costs.

Source: Soils Newsletter, Vol. 32, No.1, July 2009

mountain specificities that favoured the provision and protection of CPRs are bypassed under the activities and processes promoted by globalisation through state, market and rural communities.

Increasing challenges faced around the world, from the recent global situation caused by soaring food prices, high energy and input costs, increasing environmental concerns to issues of climate change provide justification for policy makers to introduce supportive policies and institutional services, including direct payment to farmers for environmental services from agricultural land use. In this way, global challenges could provide opportunities to accelerate the adoption process of CA, and institutional mechanisms need to strengthen to meet this need for its wider impact on agriculture.

SNIPPETS

Continued from Page 8 Column 2

proposals for research agendas and political action, and discuss how innovation systems can achieve sustainability through various topics covered under different sessions. "Innovating to link production and conservation", "Questioning social equity", "Learning and being creative", "Acting collectively", and "Renewing research models and practices" would be the topics of discussion in this symposium and it intends to cover a large variety of field including farming system, plant breeding, natural resource management, food sector and food industries, social innovations for rural development, urbanization and agriculture etc. For more information about the symposium, registration and submission of abstract, please follow the link: www.isda2010.net

PUBLICATIONS

Gonzalez E., Holgado A., Gomez M., Veroz O. and Marquez F. 2007. Preserving The European Environment Through Conservation Agriculture and EU's Policies. http://www.ecaf.org/docs/ecaf/preservingca.pdf

"Farming for the Future - A Guide to Conservation Agriculture in Zimbabwe", published in March 2009. This manual is designed to support extension workers, trainers and implementers to promote sound Conservation Agriculture practices in Zimbabwe http://www.foodgrainsbank.ca/uploads/Conservation%20Agriculture%20Manual%20-%20Zimbabwe%20(75).pdf

Mustering Moisture - The Practice of No-Till Farming in Australia, NSW Department of Primary Industries August 2008 http://www.shop.nsw.gov.au/pubdetails.jsp?publication=9859

You may download a newly created Poster on Sustainable Agriculture as well as a Factsheet explaining the concept of Minimum Tillage by clicking on their links on our website page www.conserveagri.org/links.htm. Earlier issues of the newsletter and other content may also be downloaded from the same location.

INFOPIX

This section will present research data in pictorial form from past studies for benefit of readers

CA Experiments in Wheat and Maize in Rainfed Region of Mexico

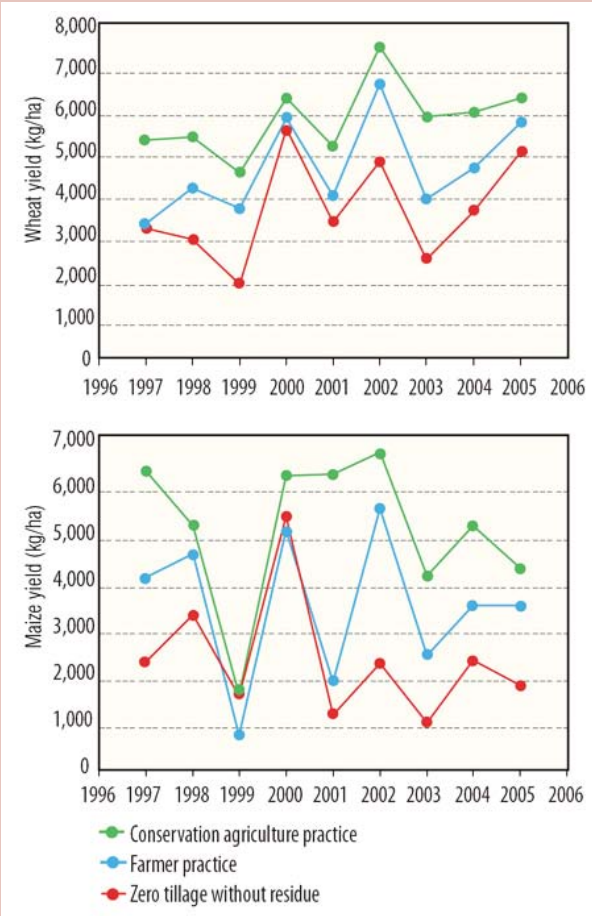
CIMMYT conducted research studies on wheat and maize in the El Batan region of Mexico based on three parameters:

(i) adoption of conservation agriculture practice

(ii) conventional agriculture practice

(iii) zero tillage practice without residue retention.

A comparison of wheat and maize yield obtained by them from 1996 to 2006 for these parameters is shown in the figure below. From the figure, it can be seen that over the years, with adoption of CA practice, yield has always been stable and higher as compared to conventional practices of heavy tillage, and also when zero tillage practices are pursued without retaining crop residue. In the long-run, CA systems have proven to be sustainable as they improve soil structure, save water, and reduce labour and energy costs.



Source: Concentration on Conservation: Agriculture that benefits farmers and the land. CIMMYT Annual Report 2007-2008

SNIPPETS

Conservation agriculture in rainfed areas of A.P.

The system of Conservation Agriculture is gaining ground in dryland areas of AP as is evident from the fact that farmers are being encouraged to adopt CA practices by RUDO, an NGO. To promote sustainable dryland farming in these areas adopting CA methods and to demonstrate various advantages of CA, promotional activity in the form of picture charts and distribution of pamphlets were conducted to create awareness about the no-till system. Two training camps for farmers were conducted, and topics such as conservation of soil organic matter and role of crop residue were discussed. It has been reported that these activities have inspired the farmers, as a result of which, farmers have already started adopting CA practices in a section of their land.

The organisation is also promoting no dig vegetable gardening based on CA principles wherein the vegetable garden is covered with crop residue (paddy straw and leaves) and vegetable seeds directly sown on soil cover using a stick to make hole. This method is found to be very simple, low cost, less water and manure requirement, no weed problem along with time and labour savings.

Upscaling Conservation Agriculture in Africa

This is one of the sub-themes of the 5th Conference of Africa Soil Science Society to be held from 22-28 Nov., 2009 in Yaonde, Cameroon. The session will discuss challenges of promoting and upscaling CA that strives to achieve profits through sustained production levels while concurrently conserving the environment. The objective of the conference is to bring together African soil scientists, interested stakeholders, and policy makers to help disseminate acquired knowledge and technology for benefit of the continent's population. The conference through its outputs will make a significant contribution towards ensuring sustainable land management, food security and sustained livelihoods in Africa. For more info, please browse: http://www.asssonline.org/5thASSSConference_2nd_announcement.pdf

Regional Workshop to create the Conservation Agriculture Network in South East Asia, CANSEA, Vientiane

A regional workshop will be organized in Vientiane, Laos, by the French Centre de Coopération Internationale en Recherche Agronomique pour le Développement - CIRAD and the Sector-based Programme in Agro-ecology (PROSA) of the Ministry of Agriculture & Forestry of Lao RDP on 29th and 30th September 2009 to create the Conservation Agriculture Network in South East Asia - CANSEA. Research & Development institutions that conduct R&D programmes on CA in South East Asia will be invited to officially create the network and to define its regional objectives, programme, work plan and agenda. The workshop will define the network structure (status, organisation, operational functioning), to appoint a Regional Coordinator, and to identify R&D priorities based on both national & regional interest. Network Members will share experiences and results; define regional priorities and design corresponding research programmes; develop synergies within the region for CA promotion & development; and search and mobilize funding to implement regional initiatives. For more information please contact Jean-Claude Legoupil, PROSA, jclegoupil@etllao.com, +856203330723.

Regional Workshop on "Nutrient Use Efficiency in Agriculture", CSSRI, Karnal

A regional workshop on nutrient use efficiency in agriculture is being organized by Central Soil Salinity Research Institute (CSSRI) and Indian Council of Agricultural Research (ICAR) from 9-11 September 2009. Issues pertaining to resource conservation technology involving zero-tillage, residue retention, and crop diversification to be encouraged in the region for achieving greater input use efficiency besides conserving environment will be debated in the proposed symposium. The workshop efforts will aim to increase nutrient use efficiency to achieve food and nutritional security in SAARC region. A copy of concept note can be downloaded from: http://www.cssri.org/nutrient.pdf

New publication on CIMMYT's international training for conservation agriculture

A study entitled "Impacts of CIMMYT's international training linked to long-term trials in conservation agriculture: 1996-2006," was presented on 9 June 2009, at CIMMYT-El Batán. The study focused on outcome and impact of training for scientists in public, private, and non-governmental sectors in agronomy and sustainable management of natural resources. More than 80 trainees participated in CIMMYT conservation agriculture (CA) training courses. To view this study, click on the link: http://www.cimmyt.org/english/docs/impacts/impactstrainingca.pdf

Governments in Southern Africa endorse Conservation Agriculture as a pathway to food security

On 11th April 2009, African Press Organization (APO), Permanent Secretaries and Directors of Agriculture in Southern Africa, farmers unions, researchers and representatives from AU-NEPAD, COMESA and FAO renewed their commitment to support farmers in their effort to use Conservation Agriculture (CA) as an avenue for increasing productivity and income. For more details, click the link: http://appablog.wordpress.com/2009/04/11/governments-in-southern-africa-endorse-conservation-agriculture-as-a-pathway-to-food-security/

ISDA 2010 Symposium

The Innovation and Sustainable Development in Agriculture and Food (ISDA) Symposium "Facing the crisis and growing uncertainties, can science and societies reinvent agricultural and food systems to achieve sustainability?" will be held at Corum Convention Center in the city of Montpellier, France from 28 June to 1 July 2010. The Conference aims to target researchers, stakeholders, and policy makers from different spheres to review changes in the way research can contribute to innovation, reflect upon future choices, identify new

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