

# SDIP ADVOCACY BRIEF No.1

Sustainable Development Investment Portfolio (SDIP)

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## Promoting Efficient Use of Resources through Regulations and Knowledge Sharing on Sustainable Agricultural Practices in South Asia

### Executive Statement

The resource-intensive cereal based cropping systems in the river basins of Indus, Ganges and Brahmaputra has led to depletion of water resources and degradation of the environment. In order to ensure food security and to counteract the effects of changing climate, a paradigm shift to sustainable climate resilient agricultural practices is inevitable. This is also a time to relook at policies at subnational and national levels to make certain that they create an enabling environment for the adoption of such practices. Drawing on our interaction with relevant stakeholders at the grassroots, the following measures have been suggested to promote resource use efficiency in agriculture to make it sustainable and resilient:

- There is a greater understanding and awareness of resource scarcity and related challenges for agriculture at the grassroots. Subsequently, communities have developed effective and successful practices to cope with the situation. Given that resource scarcity situation is comparable across the region, it is important to identify such sustainable agricultural practices, share the knowledge, and scale up practices through incentives and regulations.
- The situation warrants for reviewing the current input subsidy regime for resource efficient practices and moving away from resource intensive farm practices.
- The transformation in the sector could be inclusive by engaging community leader and CSOs in local level (and subnational) agricultural policy and planning.

### Domains of Change

Here, our engagements aim to contribute to following domains of change:

- Enabling national and subnational policy and regulatory environment for sustainable agricultural knowledge and extension service.
- Civil society voice for change, reform and standards.

### Context

With the advent of climate change, the frequency of weather aberrations in the form of floods, droughts, heat waves etc. have increased, threatening the sustainability of agriculture. Here comes the relevance of climate resilient sustainable agricultural practices which makes efficient and sustainable use of resources so as to reap maximum benefits. Given below are a few recommendations that are pragmatic and can pave the way for sustainable use of natural resources.

These practices have been identified and promoted by CUTS strategic partners – Centre for Research in Rural and Industrial Development (CRRID), Punjab; Nand Educational Foundation for Rural Development (NEFORD), Uttar Pradesh; Indian Grameen Services (IGS) BASIX, Bihar and *Rashtriya Gramin Vikas Nidhi* (RGVN), Assam. International research organisations, such as Australian Centre for International Agricultural Research (ACIAR) and International Maize and Wheat Centre (CIMMYT) are also promoting resource efficient technologies and practices under the aegis of Consultative Group on International Agricultural Research (CGIAR).

## Recommendations, CUTS Engagement Strategy and Expected Outcomes

### **Identification of Sustainable Agricultural Practices, Sharing the Knowledge and -Facilitating Scale-up**

It is evident from CUTS Diagnostic and Perception studies that there are solutions to address the situation and enhance resource use efficiency but its adoption is sporadic and mostly localised. Looking at the Indus basin, major challenges identified were water intensive cropping pattern, fuelled by power subsidies, and resulting in depleting water tables. It was also observed that technologies like laser levelling, tensiometer, conservation tillage and micro irrigation are being practised quite successfully in parts of Punjab, India. Lack of awareness, and at times, high capital cost eluded farmers from adopting these practices. These water saving practices can be adopted in Punjab and Pakistan with necessary support by the provincial government.

**Laser levelling** has been promoted in the state of Punjab to save water, by offering subsidy on its purchases as well as making it available through customs hiring from cooperative societies. Many studies indicate that adoption of laser-levellers saves water and also enhances yield by evenly application of water. Similarly, the state has introduced considerable amount of subsidies in case of water-saving techniques of irrigation such as sprinklers and drip systems. Farmers have been laying the network of underground pipes to transport water across the fields which results in reduced maintenance, evaporation and wastage as compared to open water channels.

But, such measures are not adopted in any impactful manner because of **non-existence of mechanism to expose and educate farmers about virtues of emerging technologies**. The **non-functionality of agricultural extension services** compounds the problem. The state has yet to reap the potential of emerging technologies in areas of water saving and conservation.

Source: **RRRID, Punjab** (Policy Brief 2015: 'Remodelling Water Use in Indian Punjab for Efficiency and Sustainability')

Unlike the Indus basin, the fertile basin of Ganges is dominated by small and marginal holdings. Periodic droughts, floods and increasing salinity have created a great demand for short duration and stress tolerant varieties in this region. The situation is similar in Bihar and in the Terai region of Nepal and parts of West Bengal and Bangladesh.

**Stress tolerant crop varieties:** A large number of candidate genotypes were tested and screened for resilience to different stresses using 'Mother' and 'Baby trials' and the promising varieties/genotypes were identified through 'Participatory Varietal Selection' (PVS) approach by NEFORD and are being promoted among farmers, as the adaptation strategy to reduce vulnerability. Drought, submergence and saline tolerant varieties were selected which can be cultivated in similar agro ecological situations.

**Double transplanting:** NEFORD upgraded and promoted an age-old practice of double transplanting in rice, called '*Sanda Method*'. The technique seems to provide an excellent solution to problems arising due to delayed monsoon. It requires only 4 kg seeds to transplant one ha area and is suitable only for long duration rice variety like Moti, Swarna, Kalanamak etc.<sup>1</sup>

**Direct seeding of rice:** Direct-seeded rice saves labour by eliminating the need to prepare seedbeds and transplant seedlings. It uses less water and matures earlier. This can be adapted in Eastern UP Bihar, West Bengal and parts of Bangladesh which experience seasonal drought.

Source: NEFORD, UP

Dry seeded rice (DSR) can be readily adopted by small as well as large farmers, provided that the required machinery is locally available (e.g. through custom hire). This has been promoted in the Eastern Gangetic Plain through Cereals Systems Initiative for South Asia (CSISA) implemented by the CGIAR institutions of IRRI and CIMMYT.<sup>2</sup>

**Zero tillage:** Though zero tillage has been found successful in North west India (Indus basin), it is not popular in the Gangetic belt. This technique is known to conserve soil from degradation and also reduce the cost of cultivation but is not popular due to lack of awareness, non-availability of machinery/drill and service centre and lack of credit facilities. IGS has been promoting this practice in the Mungar district of Bihar.

*Source: IGS, Bihar*

Through its Sustainable and Resilient Farming Systems Initiative (SRFSI) programme, ACIAR aims to transform agriculture in the Eastern Gangetic Plain by linking with research programmes, such as CSISA. Under this, conservation agriculture is being promoted through surveys and discussions with community households, women, farmers, and the private sector in Bangladesh and Eastern India with the support of NGOs and farmers club.<sup>3</sup> It has been found that conservation agriculture is superior to conventional tillage in terms of yield and economics in rice-wheat cropping system.

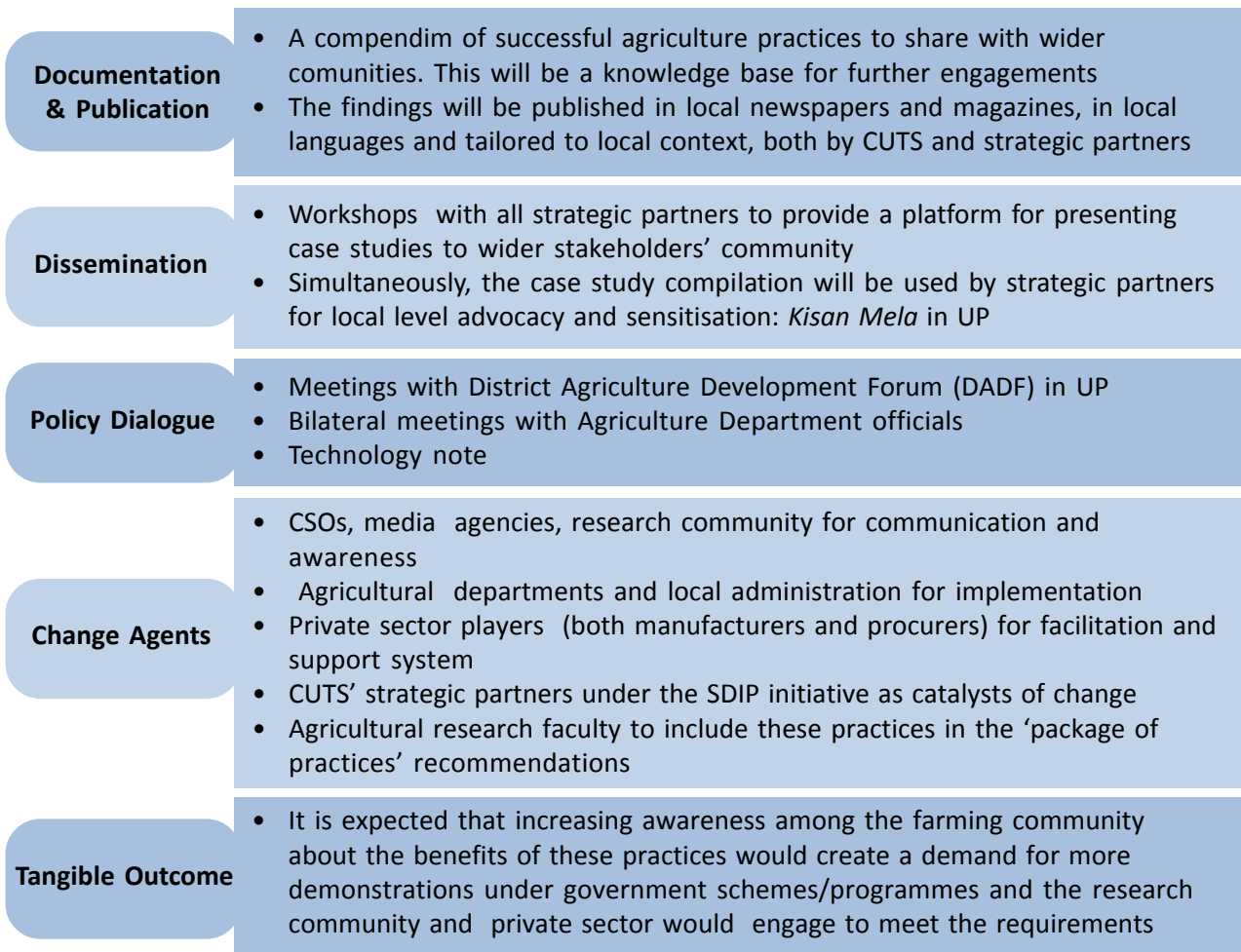
In submerged agricultural land and in the sandy areas of the river bank of Ganges and Brahmaputra, floating beds and sandy soil cultivation can be adopted respectively to grow vegetables as demonstrated by RGVN. These practices can be easily adopted in the similar agro climatic zones across the South Asian borders (for example: sandy soil cultivation and floating bed cultivation in eastern India can be replicated in the Char<sup>4</sup> and flood prone areas of Bangladesh and elsewhere).

**Floating bed vegetable cultivation:** Vegetables are grown in floating beds prepared from the biomass of water hyacinth. It can be practised in still water bodies where there is no tidal activity. This can be adopted in water hyacinth affected water bodies in Assam, West Bengal and Bangladesh

**Sandy soil cultivation:** In this technique, vegetables are grown in sandy soil unfit for any cultivation. This can be practiced in the Char areas (mid channel bars of the river Brahmaputra and its tributaries, are locally referred to as a char area), where soil is sandy and rendered unfit for cultivation after the floods recedes. Cucurbitaceous vegetables (gourds) are mostly grown using this technique

*Source: RGVN, Assam*

Across the basins it was observed that there is a need for scaling up of successful practices/models with due policy support and wider dissemination. It would be opportune to identify successful practices, enable cross-basin and cross-border learning, and facilitate scaling of those practices in favourable agro-climatic zones. With this objective, CUTS advocacy activities will focus on following interventions:



***Reorienting Agricultural Incentives to Promote Resource Efficient Agricultural Technologies and Sustainable Practices***

While the goal of food production has been achieved to a great extent, it has resulted in skewed usage of limited vital resources, and thus, has contributed to growing unsustainability in the sector. The emergent scenario warrants dismantling of flawed agricultural subsidy regimes and reorientation of public investment to promote resource efficiency and sustainable practices. Owing to the current subsidy regime in India, there is a huge imbalance in the use of fertilisers. Urea alone occupies 58.8 per cent of the total fertiliser consumed in the country. In Pakistan, fertilisers seem to be the most costly input in agriculture.

One of the most contentious issues surrounding input subsidies, in general, and fertiliser, in particular, in India is how much of the subsidy actually reaches farmers. Rice is the most heavily subsidised crop followed by wheat, sugarcane and cotton. These four crops account for about two-third of total fertiliser subsidy. A reduction in fertiliser subsidy is likely to have adverse impact on farm production and income of small and marginal farmers as they do not benefit from higher output prices but do benefit from lower input prices.<sup>5</sup>

Possible reorientation options could be targeting subsidies in regions of low fertiliser use/low productivity or rationing of subsidies by limiting the volume of subsidy. The High Level Committee of Parliament has recommended that farmers should be given direct cash subsidy (of about Rs 7000/ha) and the fertiliser sector can then be deregulated. This would help plug diversion of urea to non-agricultural uses as well as to neighbouring countries, and help raise the efficiency of fertiliser use. Popularising soil test based nutrient application by the use of soil health cards would also improve the nutrient use efficiency and improve yield.

### Evidences from Perception survey

Across Indian states, Urea and Di Ammonium Phosphate (DAP) respectively emerged as the predominant form of fertilisers used by 100 and 98.9 per cent respondents in Punjab; 98.8 and 100 per cent respondents in Uttar Pradesh; 98.8 per cent respondents in Bihar; 90 and 75 per cent respondents in Kolkata; and 38 and 75 per cent respondents in Assam. This clearly indicated the prominence of nitrogenous fertilisers affecting the nutrient balance in soil.

*Source: Perception Study, CUTS International*

CUTS advocacy engagement with regard to input subsidy will focus on following aspects:

#### Review Fertiliser Policy

- Meeting with DADF in UP
- National workshop in UP
- Press release
- Articles and op-eds

#### Change Agents

- Agriculture Department officials, research faculty, Indian Council of Agricultural Research (ICAR) representative, policy experts, civil society organisations (CSOs), farmers , media in India

#### Tangible Outcome

- It is expected that policymakers start discussions on reorienting incentives and subsidies

The use of Axial Flow Pumps (AFPs) for irrigation is being promoted by international research organisations like ACIAR and CIMMYT in Bangladesh. AFPs have higher discharge rate than centrifugal pumps, it saves fuel and reduces irrigation time requirements and are suited for surface irrigation systems. Targeting subsidies to energy efficient pump sets and developing supply chains through public private partnerships would popularise these technologies with small farmers.

## Institutional Arrangements Required for the Proposed Transformation

It is evident from the discussion that several solutions exist for enhancing efficient use of resources across the basins. Some of them are location-specific while others can be replicated region-wide. For example, the technology of zero tillage and laser levelling can be replicated provided there is a provision for custom hiring and local manufacturers and agro service centres. Practices like floating beds can be followed only in regions of water stagnation whereas DSR can be widely promoted across the three basins.

Promoting sustainable agricultural practices through policies and regulations, which will offer incentives to some and put a penalty on others, will have some degree of social opposition. At the same time, bringing in the proposed transformation in the sector will require policy change at the higher level as well as behavioural change at the farm level. CSOs and community leaders can bring in local perspective and represent local needs for effective planning. Hence, the role of NGOs, Community Based Organisations (CBOs) like Self Help Groups (SHGs), and farmer producer organisations (FPOs) to name few are crucial in popularising these practices.

Government extension functionaries need to set up on-farm demonstrations of successful practices and should undertake capacity building and training of farmers on package of practices associated with each practice. It should also render support through schemes, incentives and build partnerships with the private sector, especially in the case of machineries like zero tillage equipment and energy efficient pump sets to increase access to these technologies at affordable prices.

## Operational Strategy

Raising civil society voice in favour of these messages is the key in the strategy.

- 1) CUTS has already started documenting case studies along with its partners; the compilation will be published by the end of March 2016 and shared in the dissemination meeting organised by partners at subnational levels from April onwards. CUTS partners have a fairly good network of NGOs, media and also have linkages with state departments.
- 2) Agriculture being a state subject in India, the advocacy for better incentives has to be initiated at state level. Here again, partners and their linkages will play a key role. The advocacy message related to fertiliser subsidy is concerned with Central Government and hence CUTS will be taking forward those messages.
- 3) Although messages related to incentives and regulatory aspects are very much relevant, it needs time, constant pressure and follow up with the change agents to realise these.

## Endnotes

- 1 Singh, R., & Singh, R. (2013). *NEFORD's Adaptation Strategy to Climate Change: A farm level practical approach*. Lucknow: NEFORD
- 2 Yadav, S. 'Guidelines for dry seeded rice (DSR) in the Eastern Gangetic Plains of India', CIMMYT Institutional Multimedia Publications Repository, 2013, available at:  
<http://repository.cimmyt.org/xmlui/bitstream/handle/10883/3395/98525.pdf?sequence=1&isAllowed=y>
- 3 'Sustainable and resilient farming systems intensification in the eastern Gangetic Plains', ACIAR Project Highlights, March 2015, available at:  
[http://aciarc.gov.au/files/sfrsi\\_project\\_highlight\\_one.pdf](http://aciarc.gov.au/files/sfrsi_project_highlight_one.pdf)
- 4 A sand bank of a river formed due to alluvial deposition in Ganges – Brahmaputra basin is called 'Char' in local language in Bangladesh
- 5 Sharma, Vijay Paul. 'Dismantling Fertilizer Subsidies in India: Some Issues and Concerns for Farm Sector Growth', Indian Institute of Management Ahmedabad, September 2012, available at:  
<http://www.iimahd.ernet.in/assets/snippets/workingpaperpdf/14668129402012-09-01.pdf>



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