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| --- | --- |
| **ACIAR_inline PC**  **ANNEX A** | |
|  | Project proposal |
| **project** | Sustainable and resilient farming systems intensification in the eastern Gangetic Plains (‘SRFSI’) |
| **project number** | **CSE/2011/077** |
| **proposal phase** | **Full proposal – Variation 5** |
| **prepared by** | **Dr. Brendan Brown, Lennart Woltering, Dr. Mahesh K Gathala and Dr. Thakur P. Tiwari , International Maize and Wheat Improvement Center (CIMMYT)**[[1]](#footnote-2) |
| **research program manager** | **Dr. Eric Huttner (CROPS)** |

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# Project outline

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| Project number | CSE-2011-077 – Variation 5 |
| Project title | Sustainable and Resilient Farming Systems Intensification in the Eastern Gangetic Plains of South Asia (SRFSI)- var 5 |
| ACIAR program area | CSE |
| Proposal stage | Full |
| Commissioned organisation | International Maize and Wheat Improvement Center (CIMMYT) |
| Project type | Large |
| Geographic region(s) | South Asia |
| Country(s) | Bangladesh, India, Nepal |
| Project duration | 7 years 2 months |
| Proposed start date | 12 May 2014 |
| Proposed finish date | 30 June 2021 ~~30 June 2020~~ |
| Time to impact | Category 1 |

## 1.1 Funding request

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Amounts A$ | Totals A$ |
| Year 1 (FY2013/2014) | Pay 1 | 711,798 (Paid) | 711,798 |
| Year 2 (FY2014/2015) | Pay 2 | 1,215,554 (Paid) | 2,330,324 |
| Pay 3 | 1,114,770 (Paid) |
| Year 3 (FY2015/2016) | Pay 4 | 718,294 (Paid) | 1,447,139 |
| Pay 5 | 728,845 (Paid) |
| Year 4 (FY2016/2017) | Pay 6 | 975,479 (Paid) | 1,647,515 |
| Pay 7 | 672,036 (Paid) |
| Year 5 (FY2017/2018) | Pay 8 | ~~593,372~~ 965,120 (593,372 Paid) | ~~1,163,226~~ 2,124,183 |
| Pay 9 | ~~569,854~~ 1,159,063 (Paid) |
| Year 5 (FY2018/2019) | Pay 10 | 793,145 (Paid) | 793,145 |
| Year 6 (FY 2019-2020) | Pay 11 | 625,658 ~~645,658 (~~Paid~~)~~ | 625,658 ~~645,658~~ |
| Year 7 (FY 2020-21) | Pay 12 | 20,000 | 20,000 |
| Total |  | ~~7,300,002~~ **9,699,761** | ~~7,300,002~~ **9,699,761** |

## 1.2 Key contacts

#### Project leader: Commissioned IARC

|  |  |
| --- | --- |
| Title and name | Dr. Brendan Brown |
| Position | Agricultural Innovation Scientist |
| Organisation | International Maize and Wheat Improvement Center (CIMMYT) |
| Phone | +977 985 1243704 |
| Fax | n/a |
| Email | [b.brown@cgiar.org](mailto:b.brown@cgiar.org) |
| Postal address |  |
| Street address  (if different to postal) | NARC Campus, Khumaltar, NEPAL |

#### ~~Project Science Coordinator: Commissioned IARC~~

|  |  |
| --- | --- |
| ~~Title and Name~~ | ~~Dr Mahesh K Gathala~~ |
| ~~Position~~ | ~~Systems Agronomist~~ |
| ~~Organisation~~ | ~~International Maize and Wheat Improvement Center (CIMMYT)~~ |
| ~~Phone~~ | ~~+880-1730426384~~ |
| ~~Fax~~ | ~~+880-2-9896676~~ |
| ~~Email~~ | [~~M.Gathala@cgiar.org~~](mailto:A.McDonald@cgiar.org) |
| ~~Postal address~~ | ~~P.O. No. 6057, Gulshan-2, Dhaka-1212. Bangladesh~~ |
| ~~Street address  (if different to postal)~~ | ~~CIMMYT-Bangladesh, House# 10B, Road-53, Gulshan-2, Dhaka-1212 (Bangladesh)~~ |

#### Administrative Contact: Commissioned IARC

|  |  |
| --- | --- |
| Title and name | Michelle Guertin |
| Position | Head, Project Management Unit |
| Organisation | International Maize and Wheat Improvement Center (CIMMYT) |
| Phone | +52(595) 9521900 |
| Fax | +52(595) 9521983 |
| Email | [cimmyt-pmu@cgiar.org](mailto:cimmyt-pmu@cgiar.org) |
| Postal address | Apdo. Postal 6-641, 06600 Mexico, D.F., Mexico |
| Street address  (if different to postal) | Km. 45, Carretera Mexico-Veracruz, El Batan, Texcoco, Edo. de México, CP 56237 México |

#### Project contact person: - Department of Agricultural Extension (DAE)

|  |  |
| --- | --- |
| Title and name | Dr Chaitanya Das |
| Position | Director, Field Crops |
| Organisation | DAE |
| Phone | +880-2-9135587 |
| Fax | +880-2-8113032 |
| Email | info@dae.gov.bd |
| Postal address | Bangladesh Agricultural Research Council New Airport Road, Farmgate Dhaka 1215, Bangladesh |

#### Project contact person: - Bangladesh Agricultural Research Institute (BARI)

|  |  |
| --- | --- |
| Title and name | Dr Abul Kalam Azad |
| Position | Director General |
| Organisation | Bangladesh Agricultural Research Institute (BARI) |
| Phone | +88 02 9252715; 8801714179048 |
| Email | [dg.bari@bari.gov.bd](mailto:dg.bari@bari.gov.bd) |
| Postal address | BARI, Joydebpur, Gazipur-1701, BANGLADESH |

#### Project contact person: - Rangpur-Dinajpur Rural Services (RDRS), Bangladesh

|  |  |
| --- | --- |
| Title and name | Mohammad Enamul Kabir |
| Position | Executive Director |
| Organisation | Rangpur-Dinajpur Rural Services (RDRS) |
| Phone | +88 02 8954384-86, +8801730328000 |
| Fax | +88 02 8954391 |
| Email | [enam@rdrsbangla.net](mailto:enam@rdrsbangla.net) |
| Postal address | Hs 43, Road-10, Sector-6, Uttra, Dhaka-1230, Bangladesh |

#### Project contact person: - Indian Council for Agricultural Research (ICAR), India

|  |  |
| --- | --- |
| Title and name | Dr B.P Bhatt |
| Position | Director, Research Complex for the Eastern Region |
| Organisation | Indian Council of Agricultural Research (ICAR) |
| Phone | Ph:+91-612-2228805,2228882, 2223962 (Director) |
| Fax | FAX: +91-612-2223956 |
| Email | [drbpbhatt.icar@yahoo.com](mailto:drbpbhatt.icar@yahoo.com) |
| Postal address | ICAR Parisar, P.O Bihar Veterinary College, Patna- 800014, Bihar, India |

#### Project contact person: - Bihar Agricultural University, India

|  |  |
| --- | --- |
| Title and name | Dr. Ajoy Kumar Singh |
| Position | Vice-Chancellor |
| Organisation | Bihar Agricultural University (BAU) |
| Phone | ~~+91 6274 240 226~~ |
| Email | vcbausabour@gmail.com |
| Postal address | Bihar Agricultural University, Sabour, Bihar 813210 |

#### Project contact person: - Uttar Banga Krishi Vishwavidyalaya (UBKV) University, India

|  |  |
| --- | --- |
| Title and name | Dr Apurba Chowdhury |
| Position | Professor |
| Organisation | Uttar Banga Krishi Vishwavidyalaya (UBKV) University |
| Phone | +91-9434317558 |
| Email | [apurba.ubkv@yahoo.in](mailto:apurba.ubkv@yahoo.in) |
| Postal address | Uttar Banga Krishi Viswavidyalaya, Coochbehar, West Bengal, India |

#### Project contact person: - West Bengal Department of Agriculture, India

|  |  |
| --- | --- |
| Title and name | Dr Sampad Ranjan Patra |
| Position | Director |
| Organisation | Department of Agriculture |
| Phone | +91-33- 2214 5856 |
| Fax | +91-33-22145307 |
| Email | [jdextn.agri.wb@gmail.com](mailto:jdextn.agri.wb@gmail.com); |
| Postal address | Directors of Agriculture, Writers Building, Kolkata,-700001 (West Bengal) |

#### Project contact person: - JEEViKA (Bihar Rural Livelihoods Project – BRLP), India

|  |  |
| --- | --- |
| Title and name | Manoj Kumar |
| Position | State Project Manager- Livelihoods. |
| Organisation | BRLPS |
| Phone | +919771478322 |
| Email | [manojk@brlp.in](mailto:manojk@brlp.in); [manojgentech@gmail.com](mailto:manojgentech@gmail.com) |
| Postal address | Vidyut Bhavan -II, 2nd Floor, Bailey Road,  Patna-800021, INDIA |

#### Project contact person: - Sakhi Bihar, India

|  |  |
| --- | --- |
| Title and name | Suman Singh |
| Position | Secretary (Officer-in-Charge KVK) |
| Organisation | SAKHI |
| Phone | +91-9931449114, 9431021204 |
| Email | [sakhipatna@rediffmail.com](mailto:sakhipatna@rediffmail.com) |
| Postal address | Matsya Nagar, Bhagwatipur, Post Office-Rudrapur, Via-Andrathari, Jhanjharpur, Madhubani |

#### Project contact person: - Nepal Agricultural Research Council (NARC), Nepal

|  |  |
| --- | --- |
| Title and name | Dr Renuka Shrestha |
| Position | Chief, Agronomy Division |
| Organisation | Nepal Agricultural Research Council |
| Phone |  |
| Fax |  |
| Email | [renuka.shrestha@gmail.com](mailto:renuka.shrestha@gmail.com) |
| Postal address | Nepal Agricultural Research Council (NARC), Singhadurbar Plaza, Post Box No. 5459, Kathmandu, Nepal |

#### Project contact person: - Nepal Department of Agriculture, Nepal

|  |  |
| --- | --- |
| Title and name | Dr Dili Ram Sharma |
| Position | Director General |
| Organisation | Department of Agriculture (DoA), Ministry of Agricultural Development, Government of Nepal |
| Phone | +977 1 5521127 |
| Fax | +977 1 5524093 |
| Email | [sharmadilli.2018@gmail.com](mailto:sharmadilli.2018@gmail.com) |
| Postal address | |  | | --- | | Ministry of Agricultural Development, Department of Agriculture | | Hariharbhawan, Lalitpur, Nepal | |

#### Project contact person: - Commonwealth Scientific and Industrial Research Organization (CSIRO)

|  |  |
| --- | --- |
| Title and name | Dr Peter Brown |
| Position | Senior Research Scientist, Farming Systems South Team, Agricultural Systems Program, CSIRO Ecosystem Sciences |
| Organisation | CSIRO |
| Phone | +61 2 6246 4086 |
| Fax | +61 2 6246 4094 |
| Email | [Peter.Brown@csiro.au](mailto:Peter.Brown@csiro.au) |
| Postal address | GPO Box 1700, Canberra, ACT, 2601 Australia |

#### Project contact person: - Curtin University

|  |  |
| --- | --- |
| Title and name | Dr Fay Rola-Rubzen |
| Position | Deputy Dean, Research & Development |
| Organisation | Curtin Business School, Curtin University |
| Phone | +618 9266 2122 |
| Fax | +618 9266 7694 |
| Email | [F.Rola-Rubzen@curtin.edu.au](mailto:F.Rola-Rubzen@curtin.edu.au) |
| Postal address | Curtin Business School, Curtin University, GPO Box U1987, Perth WA 6845, Australia |

#### Project contact person: - University of Queensland

|  |  |
| --- | --- |
| Title and name | Dr Ram Dalal/Dr Neal Menzies |
| Positions | Professor of Soil and Environmental Science,  Head, School of Agriculture and Food Sciences and  Dean of Agriculture |
| Organisation | University of Queensland |
| Phone | +61 7 5460 1047; +61 7 3365 2059 |
| Email | [r.dalal@uq.edu.au](mailto:r.dalal@uq.edu.au); [n.menzies@uq.edu.au](mailto:n.menzies@uq.edu.au) |
| Postal address | Room 128, Building 8117a, Gatton Campus or Room S304, Level 3, Hartley Teakle Building (83), St Lucia |

#### Project contact person: - International Food Policy Research Institute (IFPRI)

|  |  |
| --- | --- |
| Title and name | Dr Avinash Kishore |
| Position | Scientist, South Asia |
| Organisation | IFPRI |
| Phone | Work: +91 11-2584-6565 |
| Fax | Fax: +91 11 2584.8008 |
| Email | A.Kishore@cgiar.org |
| Postal address | NASC Complex, CG Block, Dev Prakash Shastri Road, Pusa,  New Delhi 110012, India |

#### Project contact person: Agrevolution

|  |  |
| --- | --- |
| Title and name | Shashank Kumar |
| Position | Co-founder & Chief Executive Officer (CEO) |
| Organisation | Agrevolution |
| Phone | +91 612-2352244: +91 8757912744 |
| Email | [shashank@agrevolution.in](mailto:shashank@agrevolution.in); [shashank.vatsa@gmail.com](mailto:shashank.vatsa@gmail.com); [green.agrevolution@gmail.com](mailto:green.agrevolution@gmail.com) |
| Postal address | 8/83, Lohiya Nagar,  Kankarbagh, Patna-20,  Bihar, India |

## 1.3 Project summary

Justification

The project, Sustainable and Resilient Farming Systems Intensification (SRFSI) in the Eastern Gangetic Plains (EGP) is an investment in R&D by the Australian Government over four years (2014-18) in four regions: the Indian States of Bihar and West Bengal, northwest Bangladesh and the eastern Terai plains of Nepal. It is part of a larger investment in the region stretching into Northern Pakistan called Sustainable Development Investment Portfolio (SDIP). The food and agricultural component is jointly funded by the Department of Foreign Affairs and Trade (DFAT) and ACIAR (which also coordinates the component) and aims to improve the integrated management of food, energy and water in the EGP of the Ganges and Brahmaputra Basins.

The SRFSI addresses two research questions: would farm management practices based on the principles of conservation agriculture (CA) and the efficient use of water resources provide a foundation for increasing smallholder crop productivity and resilience; and would institutional innovations that strengthen adaptive capacity and link farmers to markets and support services enable both women and men farmers to continue to innovate in the face of climate and economic change. The research targets rice-based systems around eight districts across the three countries of the EGP.

It was estimated that after the end of the project (2021) 1,500,000 farm households will have adopted at least one Conservation Agriculture based Sustainable Intensification (CASI) practice, technology or institutional innovation that have been promoted by the project with significant improvements of income, livelihoods and sustainability. Priorities include reduced tillage using machinery, crop diversification and rotation, (energy-) efficient water management practices, and integrated weed management practices. Establishing crops with minimal soil disturbance – reduced tillage, as opposed to conventional tillage CT - can be done using zero-tillage (ZT: seeds and fertilizer placed in a narrow slot made by a knife on a no-till seeder) or strip-tillage (ST: a narrow band of soil is cultivated). Whenever possible and appropriate, residues from the previous crop are left in the field while the crop is established. Complementary innovations such as improved varieties, soil fertility management and market access are included in CASI. Good knowledge of CASI would enable farmers to adopt it.

This target can only be achieved through the implementation of a sound scaling strategy and clear impact pathways. This variation to the SRFSI proposal focuses on one core aspect of scaling- that is- scaling through capacity development, alongside private sector engagement, linkages to markets and finances, and communication. Another key project function is the monitoring and learning from the scaling and adoption process. We want to strengthen capacities and knowledge of scaling to make a credible case so that relevant national and state programs are induced to invest further in scaling out CASI practices.

Objectives

The overall aim of the project is to reduce poverty in the EGP by improving the productivity, profitability and sustainability of smallholder agriculture.

The project has four objectives that will lead towards sustainable and resilient farming systems intensification in the EGP:

1. Understand farmer circumstances with respect to cropping systems, natural and economic resources base, livelihood strategies, and capacity to bear risk and undertake technological innovation.
2. Develop, with farmers more productive and sustainable technologies that are resilient and profitable for smallholders.
3. Catalyse, support and evaluate institutional and policy changes that establish an enabling environment for the adoption of high-impact technologies from Objective 2.
4. Facilitate widespread adoption of sustainable, resilient and more profitable farming systems through capacity development and supporting scaling activities.

Variation 3 and Variation 4 reinforce Objective 4.

Methods

The four pillars of SRFSI are i) farmer participatory technology generation, ii) local innovation systems which help overcome value chain bottlenecks, iii) enhanced capacity of market and service agents to support farmer innovation, and iv) farmer-to-farmer knowledge exchange. Variation 3 of SRFSI lays out an implementation strategy for scaling project results to new and other stakeholders through capacity enhancement at individual and institutional level. Critical elements are integration of a scaling perspective in all activities, convergence with national and state programs, the capacity gap analysis and targeting capacity enhancement and monitoring and learning. The capacities of the following groups could be targeted:

* Partners (NGO, University, Extension)- focus capacity development on organizational development, scaling strategies, process documentation, training capacity and quality, etc. to equip the partners to scale CASI beyond the project lifetime.
* Existing and new service providers- value chain and business model development, improved service delivery to farmers (finance, training, inputs), promote linking up with new/different partners (chamber of commerce, banks, etc), etc.
* Decision makers- awareness of problems and solutions around CASI, program design, theories of change and scaling, PPP, institutionalization, convergence, etc.
* Farmers- reached through partners with training on access to markets and services, organizational development, etc.

Good results on inclusiveness of women (targeting at least 35% involvement of women) through enhancing women’s entrepreneurship and training of CASI technologies and practices for women provided by women trainers will be further built on.

Partners

CIMMYT will manage the project with a complementary set of research and development partners, including national and state public research and extension services, universities, local and international NGOs. Australian universities, CSIRO, other relevant CG Centers (like IFPRI at policy level) will support and mentor national partner activities. The project will link closely with agribusiness and NGOs, and will incorporate new partners into the innovation system. Functional links will be maintained with other related projects. Important, additional, partners to reach scale through capacity enhancement are UBKV and Agrevolution, but also others who will be collaborated with through a Strategically Commissioned Grant Scheme.

Impacts

The DFAT Sustainable Development Investment Portfolio (SDIP) stipulates, in the Record of Understanding with ACIAR, targeted beneficiaries numbering 1.5 million farm households adopting at least one CASI innovation by 2021. This means that evidence based pathways, building on ongoing and planned Government and business investments will be developed targeted to different farming systems that would lead to 1.5 million farming households adopting at least one or more CASI innovations (indirect beneficiaries). The CASI innovations improve farmer livelihoods, reduce poverty and improve sustainability compared with current practices. The strategy emphasises improved capacity of district officials, local extension services, farm women and men, local entrepreneurs, service providers and other key actors. The target group for this livelihoods improvement is constituted of smallholder farmers (women and men). Through targeting input providers, service providers, and other micro-entrepreneurs, and building their business development skills, it is planned to create demand or “pull” to assist the adoption of CASI technologies, practices and institutional innovations.

Justification for variation no. 2

The project has been varied due to the Department of Foreign Affairs and Trade (DFAT) announcing budget reductions across the whole SDIP (Sustainable Development Investment Portfolio) of which CSE/2011/077 SRFSI is a major component. This development has financial implications for SRFSI implementation. CIMMYT and ACIAR have recently reviewed SRFSI progress during the first year of the project and identified areas where rebalanced investments are required, for example, where costs can be rationalised or non-essential activities to be eliminated. The main purpose of this revision is to strengthen the project management and implementation as a whole, so that the committed outputs/deliverables are achieved. There are also adjustments in project personnel, activities and the work of two partners. The proposed revision is a part of a broader strategy for improving synergies among similar projects within the region. For example, Cereal Systems Intensification for South Asia (CSISA) project has developed a series of training modules for Conservation Agriculture (CA) and associated technologies as well as training modules for service providers and agro-dealers that will be shared with SRFSI. Summary of the significant changes in the variation (no. 2) proposal:

1. Project leader, science coordinator and other minor project personnel changes.
2. Adjusted operations, activities and related budget, including:

* Reallocation to competitive grant for scaling out.
* Reduction of staff inputs of CSIRO, University of Queensland, IRRI and Department of Agriculture, Bihar.

Justification for variation no. 3

The ACIAR and DFAT Record of Understanding targets the potential to benefit 1.5 million smallholder farm households through various impact pathways with at least one CASI innovation. SRFSI variation 3 reinforces Objective 4 of the SRFSI project (*“Facilitate widespread adoption of sustainable, resilient and more profitable farming systems”)* to accelerate the processes put in place in SRFSI variation 2 to reach that target. Given the experience of SRFSI in the first 3 years, CIMMYT and partners concluded that it is necessary to focus on a massive capacity push at multiple levels and multiple actors to increase awareness, understanding to create demand and matching supply of appropriate and quality CASI innovations and inputs. Capacity building is a strategic enabler to leverage development in all areas (technology, value chains, finance, etc.) required to scale CASI. Capacities at individual and organisational level are found to be a limiting factor to adoption of the technology, within and, definitely, beyond the project lifetime. For example, limited awareness and knowledge of CASI – from farmers to entrepreneurs to extension officers to senior officials - was identified as a core constraint for scaling. And, building up awareness and knowledge will support the creation of a market for CASI services and goods, which in turn will support a profitable service delivery industry. Quality capacity building will also reduce the risk of substandard technology being promoted with reputational damage as only one of the dangers involved. Apart from farmers and actors along the value chains, also our partners need to quickly improve the way they integrate scaling principles in their work for the adoption of CASI to continue after June 2019. We want to build on good practices under variation 2 which allowed, for example, the West Bengal team to leverage more funding to promote CASI.

Justification for Variation 4

By the end of June 2019, SRFSI will finalise the majority of remaining deliverables as per the SRFSI variation 3 project document. Under the proposed plan, 74% of deliverables would be completed by the end of the period.

Variation 4 will extend the project to 30 June 2020 and will focus on the broader research question: How is momentum created for CASI in the EGP? The portfolio will focus efforts to ensure that credible pathways to scale CASI are developed, as well as providing a platform for the wider ACIAR-SDIP activities to converge and discuss a future research agenda.

Justification for Variation 5

An additional year will enable a legacy to be created on this large investment by ACIAR and DFAT. Namely, the following will be the focus on Variation 5: Testing and dissemination of the CASI visual syllabus (Volume one: Maize) and create new volumes (2] Wheat CASI; and 3] Bangladesh 2 wheel CASI); Implement Quantitative impact studies without impending on farmers who are already participating in SDIP and ACIAR studies; establish the CA centre of Excellence with UBKV and DoA in West Bengal, and complete the academic legacy of the project, particularly with socioeconomics outputs. Additional time will also mitigate the constraints raised by COVID-19 implementation and delivery.

# Background and Justification

Past food surpluses in South Asia were mainly achieved by intensifying production in regions with assured irrigation such as the Punjab and Haryana States of the Northwest Indo-Gangetic Plain (IGP) of India. However, crop yields in these favourable areas have not increased for more than a decade (Reeves et al, 2009), and the difference between attainable and farmer achieved yields (i.e. the yield gap) for crops like wheat is currently less than 1 t ha-1. In these same areas, rates of groundwater depletion are severe and energy costs for pumping are accelerating as the water table recedes (Rodell et al, 2009). Coupled with expected rates of population increase and growing competition from other economic sectors, water availability for irrigation in the NW IGP is likely to decline substantially in coming decades (IPCC, 2007). In order to meet future food needs and to foster economic development among the rural poor, there is a growing consensus that development efforts must prioritize rainfed and partially-irrigated agricultural systems where current productivity is low, such as the Eastern Gangetic Plain (EGP), but which hold sufficient scope for intensification(Namara et al., 2010; Rockstrom et al., 2010) – that is where large yield gaps persist.

The EGP region encompasses parts of India, Bangladesh and Nepal, and is home to the greatest concentration of rural poor in the world (Erickson et al., 2012). The rice-wheat cropping pattern which, together with the rice-rice system in West Bengal and NW Bangladesh, dominate the farming systems of the EGP have very low productivity and ‘…yields are at present far too variable to provide a solid foundation for food security’.[[2]](#footnote-3) Poverty and food insecurity in the region is closely linked to the small size of landholding (typically < 1 ha). Farmers have little access to assured irrigation, credit, quality seeds, fertilizers, or formal extension services[[3]](#footnote-4), relying to a large degree on local and informal advice and knowledge sharing mechanisms. These factors contribute to low adaptive capacity to climate changes and, more generally, limited ability to invest in innovation. Historically there has been a low level of investment in research and development initiatives in the region, although recently the situation has improved markedly. As a consequence, problems at the farm-scale are further compounded by comparatively weak institutions and supporting structures for agricultural development.

The EGP is prone to climate-related risks and extreme events such as floods (e.g. Koshi flood 2008), drought (e.g. summer rice 2010), and atypical cold waves (e.g. winter maize 2010). More common stresses include the early onset of terminal heat for the winter crop and uncertain timing and duration of the monsoon rains, thereby increasing the riskiness of staple cereal crop production. The EGP is projected to be one of the areas of the world most affected by climate change (see for example Ortiz et al., 2008). Production and market-based failures are already factors that constrain the adoption of improved farming practices and increased crop yields, coupled with risk-reducing technologies, are urgently needed as a precondition and pathway towards sustainable intensification. Further, there are pervasive socio-economic changes occurring that have led to large-scale migration and hence labour shortages and the feminisation of agriculture.

A scoping study in India together with further surveys and evaluations in the adjacent areas of the eastern Terai of Nepal and northwest Bangladesh have developed a good understanding of these issues and identified key technical entry points (e.g. conservation agriculture[[4]](#footnote-5) and the efficient use of available water resources) that promise to build resilience to the primary contemporary and projected climate-based risks that constrain intensification in the EGP – namely terminal heat and erratic rainfall patterns - coupled with low-levels of development of water resources

It is important to note that short-term payoffs from investments in climate risk management are essential for poorer farmers since the cost of adaptation can erode the asset bases of vulnerable groups and increase insecurity (Heltberg et al., 2009). The advantage of the proposed prioritization of conservation agriculture (CA) is that under most circumstances, after local adaptation, CA practices reduce production costs and risk and stabilize crop yields under conditions of climatic stress (Erenstein and Laxmi, 2008). Furthermore, this project prioritizes support to service providers who in turn will help provide broad-based farmer access to new CA component technologies, such as zero tillage, thereby obviating the need for individual small farmers to purchase expensive machinery.

Smallholder farmers in the EGP generally manage mixed crop-livestock systems, where the livestock component of the system is often very important. While the SRFSI project will not work on livestock *per se*, project activities will include efforts to increase the quantity and quality of feed and fodder produced on the farm through diversification and intensification of the farming system, especially in the winter. The trade-offs involved in leaving some crop residues on the soil surface in CA systems will also be evaluated.

While the challenges in the EGP are substantial, the regional knowledge sharing activities together with the institutional strengthening and co-learning inherent in the project will significantly reduce the time lags for technology adoption, especially in the less technologically-advanced parts of the region.

Based on year 1 learnings, CIMMYT and ACIAR decided to revise the original proposal and budget variation with justification, which are the integral part of a new variation proposal.

The SRFSI project will establish evidence based pathways and value chain approach that would lead to have 1.5 million farming households adopt at least one CASI innovation (see Box 1) by 2021.

**Box 1: Conservation Agriculture based Sustainable Intensification (CASI)**

CASI is a combination of Conservation Agriculture4 and Sustainable Intensification[[5]](#footnote-6). CASI is defined as a set of on-farm and supporting service practices that aim to increase efficient use of resources whilst improving farm household profitability, commonly through less soil disturbance, intensification, diversification, rational input use and better soil and water management supported by relevant input provision and marketing arrangements.

Adoption of CASI can be accounted to the project if practices are changed such that they adhere to one or more of the following improvements the project is promoting through capacity building (see Table below). Appendix B (section 7) gives a more detailed overview of the CASI innovations promoted by SRFSI. It will also be important to assess whether farmers and other actors along the value chain are aware of CASI as defined by the project, gained knowledge and skills in its application and promotion and show actual demand for CASI. In short, CASI should be known, available and bringing benefits to farmers and other actors along the value chain.

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| **Criteria** | **Description** | **Examples SFRSI promotion** |
| Less soil disturbance | Use of machinery to minimize disturbance of soils | * Zero Tillage (ZT)- seeds and fertilizer placed in a narrow slot made by a knife on a no-till seeder * Strip Tillage (ST) a narrow band of soil is cultivated |
| Intensification and diversification | Achieving higher returns per m2 of crop through more efficient planting, use of other/improved varieties/crops and/or integration of livestock | * Introduction of mung bean * Optimising crop rotations/ sequence (maize - (leafy) vegetables, maize - beans, rice -rice, rice - wheat) * Early to medium maturing stress tolerant varieties of rice, wheat, legumes/lentil * Promotion of community based seed production and marketing * Mechanized planting |
| Better soil and water management | Improving soil health and more water and energy efficient irrigation | * Application of lime and crop residues * Alternate wetting and drying, replacing rice for maize to reduce irrigation * Integrated weed management |
| Efficient use of inputs | Improvement of on-farm resource management | * Rationalise use of labour (mechanization), chemicals and varieties resulting in drastic reductions in operating costs * Applying Nutrient Manager for rice, maize, wheat, lentil |

After two years preparatory activities, the SRFSI project started in mid-2014 and work focused mainly on testing, validating and demonstrating the CASI innovations at farm and local level under various settings, conducting socioeconomic research, identifying policy constraints, establishing innovation platforms/multi-stakeholder in 8 different districts in 3 different countries – and fostering a transboundary learning platform across the EGP. The achievements under SRFSI so far lay a solid foundation of developing collaborative partnerships, identifying appropriate technologies, clarifying adoption pathways, and identifying and addressing policy, institutional and technical constraints to adoption, to achieve this. However, achieving the ambitious targets is not possible without a strengthened implementation strategy on scaling and a significant strengthening in capacities at multiple levels to increase awareness, understanding, demand and supply of appropriate CASI innovations. This SRFSI variation 3 proposal addresses the latter. Capacity enhancement of key actors in the project will also benefit the efficiency of other projects complementary to SRFSI in the short, as well as the long run.

## 2.1 Partner country and Australian research and development issues and priorities

**Bangladesh**: ACIAR is strongly focused on increased cropping systems productivity in Bangladesh, in alignment with the national goals of achieving self-sufficiency in rice production and sustaining this in the face of an ever-growing population pressure which continues to be the major goal of agricultural planning, research and extension in Bangladesh[[6]](#footnote-7).

The Bangladesh Agricultural Research Council (BARC) places high priority on ‘more productive rice-based production systems[[7]](#footnote-8) with best management practices’, ‘yield gap minimization in rice and rice-based cropping systems using management practices through participatory on-farm research’, ‘intensification and diversification of rice-based cropping systems’ and ‘management practices for DSR (direct seeded rice)’. With respect to wheat, one of BARC’s priority areas is ‘water resource management and promotion of water saving technologies, especially in the drought prone areas such as the Barind tract[[8]](#footnote-9), by replacing boro (winter) rice either with wheat or maize or winter legumes’. This project directly addresses these country priorities.

The Bangladesh Agricultural Research Institute (BARI) has included CA-based crop management systems as one of their priorities for improving overall farming system productivity.

The National Agriculture Technology Project (NATP) involves the commodity based line Departments in technology dissemination through the formation of Common Interest (farmer) Groups (CIGs) which use a 30% female membership rule and through which livelihood field schools promoting a holistic farming system approach (a mix of livestock, fisheries and crops) are held. Like India’s ATMA (Agricultural Technology Management Agency), this line department coordination mechanism could be very helpful to scaling SRFSI and a possible focus for incorporation into the existing innovation networks or systems.

The Bangladesh Agricultural Development Corporation (BADC) forms Water User Groups that propose and manage deep tube well and lift irrigation infrastructure as part of its Integrated Agricultural Productivity Project (IAPP). The Barind Multi-purpose Development Authority’s (BMDA) use of individual irrigation coupons and pre-paid metering is well regarded as an innovative method of preventing excessive drawdown on the drier Barind Tract’s falling groundwater table.

The Department of Agricultural Extension (DAE) works through Upzilla (subdistrict or block) Agricultural Officers (UAO) and Union (village/s) Level Sub-Assistant Agriculture Officers (SAAO). DAE’s Disaster and Climate Risk Management in Agriculture Project (DCRMA) runs Climate Field Schools through the Integrated Crop (ICM) and Pest (IPM) Management Clubs originally formed by the Danish International Development Agency’s (DANIDA) program of support to the agricultural sector. DAE is a SRFSI partner in both Rajshahi and Rangpur districts.

The Rangpur Dinajpur Rural Services (RDRS) is funded by an international coalition of churches and is a highly regarded NGO that now operates regionally beyond Bangladesh. RDRS forms SHGs of marginalized farmers at the union level which are federated with representation on committees at higher levels and employs Upzilla Facilitators (UFs) to ensure networking and sharing between SHGs. RDRS is the major SRFSI partner in the Rangpur District and will play a leading role in scaling out. In addition, local input and service providers pay a key role in sustainable intensification.

The Conservation Agriculture Service Providers Association (CASPA) is actively promoting the Versatile Multicrop Planter market in the most appropriate areas, building on existing network of Local Service Providers and their professional body. They need training the VMP Local Service Providers in business skills and expand farmers demand for services around LSP by awareness and capacity building programs

iDE has been working with the CIMMYT CSISA project in Bangladesh for many years and gained much experience in improving machinery value chains in the country. iDE has been an active partner of SRFSI in Nepal at the start of the project. It is proposed to pick up collaboration with iDE to work on machinery value chains in the two districts. This will allow us to benefit more from the work CSISA-MI has been doing in the region.

**India**: The SRFSI project is aligned with Government strategies, notably the emphasis on eastern India with its deep poverty but great food production potential. The project contains three elements where Australia has a comparative advantage, notably water management, conservation agriculture (zero till) cropping systems and economic policy analysis. Of the ten key areas designated in the vision of the Indian Council of Agricultural Research (ICAR)[[9]](#footnote-10) six contain aspects that will be addressed by the proposed project, which will work closely with ICAR in the target areas of Bihar and West Bengal. This project will assist ICAR to make significant progress in its priority scientific areas, including the management of natural resources (where conservation agriculture is specifically mentioned as one of the prime areas), agricultural intensification and bio-risk management - all important aspects of the proposed project.

India has several central sector programmes that are implemented at the district level and thus could be helpful with the scaling of SRFSI outputs through the coordination of activities and harmonisation of extension messages. The Bringing Green Revolution to Eastern India (BGREI) program has been running since 2010 under the National Ministry of Agriculture in seven states in the Eastern Region, which includes Bihar and West Bengal. The focus is upon block demonstrations of rice and wheat technologies with technical backstopping provided by the Indian Council of Agricultural Research (ICAR) and State Universities and their extension services (all existing Eastern India SRFSI partners). Infrastructure and input provision, especially of shallow tube well and improved input supply, are also focal activities of BGREI. Given these programs are running already, we will utilise these as much as possible in SRFSI to reduce duplication, particularly for demonstration sites, but also provide technical backstopping to further support these programs.

BGREI is implemented via the National Agriculture Development Program through a Central Assistance Scheme entitled Rashtriya Krishi Vikas Yojana (RKVY), established in 2007 and developed and implemented by State Governments. The State Governments formulate strategic action plans in conformity with the RKVY national guidelines. The National Food Security Mission (NFSM) was also launched in 2007 to raise production of rice, wheat and pulses through demonstrations and new seed varieties.

The National Initiative on Climate Resilient Agriculture (NICRA) is an ICAR network project launched in February, 2011. The project aims to enhance resilience of Indian agriculture to climate change and climate vulnerability through strategic research and technology demonstration. The demonstration sites funded under these programs can be used as learning laboratories to inform scaling.

Each State has an Agricultural Technology Management Agency (ATMA) responsible for achieving convergence in technology dissemination at the district level. However, in most cases coordination appears limited and the major activity of the ATMAs is to fund training. Building the capacity of the Bihar and West Bengal ATMAs through their incorporation into the district level Innovation Systems presents an opportunity for the scaling project.

India also has two programs that underpin the welfare state for the rural poor: the Public Food Distribution System (PFDS) and Mahatma Ghandi Rural Employment Guarantee Act (MGREGA). The PFDS is the largest in the world and certainly more extensive than the Bangladesh and Nepal equivalents. It affects smallholders both through procurement of food grain with minimum support prices (MSP), and distribution of subsidised food grain to those households holding a “below the poverty line card”. Most grain is currently procured from northwest India due to that regions higher productivity, with the result that few Bihar and West Bengal producers can access the MSP or this guaranteed market. The procured food grain is distributed to food insecure households at subsidised prices through fair-price shops. The reliability of access to subsidised grain depends on the degree of ‘leakage’ (including corruption) en route to and at the local level. The MGREGA provides interested labourers with 100 days of unskilled paid labour (largely earthworks such as road and tank rehabilitation) in the dry season, which has a strong impact upon the availability and cost of farm labour. Village Governments play a strong role in the implementation of both programs.

Bihar and West Bengal have rich social infrastructure at the local level in the form of Farmer Interest Groups (FIGs); Self Help Groups (SHGs) and Farmer Clubs. In Bihar specifically, the Bihar Rural Livelihoods Project (BRLP) is led by the World Bank and the Bihar Government funded NGO JEEViKA, an SRFSI partner. JEEViKA has an extensive social infrastructure: 15,237 Self Help Groups (SHGs); 894 Village Organizations and a cadre of Village Resource Persons. The NGO Sahki, another SRFSI partner, also has infrastructure in the form of women’s Self Help Groups, Farmer Interest Groups and Farmer Producer Companies in Bihar. TechnoServe are also involved and provide a range of business solutions.

Local social enterprises and entrepreneurs pay a critical role as input and service providers as well as knowledge and learning brokers. In fact, local entrepreneurs could be the leading players in scaling in Bihar. B4D has been successfully working with Agrevolution in Bihar, India which has an effective and novel IT platform enabled model for cost effective delivery of inputs and marketing of produce.

**Nepal.** The Government's programmes of agricultural development in Nepal are directed towards bringing positive changes in the livelihoods of the majority of agricultural communities by enhancing overall agricultural production and productivity. The Nepal Agricultural Research Council (NARC), an autonomous body with the national agricultural research mandate, has been providing support to the national economy and increasing agricultural production and productivity thereby improving farmers' living standards. The priorities of NARC focus on five thematic areas, including ‘Crops and Horticulture’ and ‘Natural Resource Management and Climate Change’[[10]](#footnote-11). Within the former, three of the five priority areas for crop (and system) management include ‘nutrient and water management practices for boro, spring and main season aerobic and transplanted rice’, ‘moisture conservation technologies for both upland and lowland rainfed cropping systems’ and ‘profitable and sustainable integrated crop management and cropping systems for different agro-ecosystems to mitigate negative effects of climate change’, while within the latter category one of the main priorities is to develop ‘climate friendly technologies to adapt to climate change’. The Department of Agriculture (DOA) focuses the extension activities in the country. This project will collaborate with NARC and DOA.

Coordination and linkage in the agricultural sector of Nepal, especially research and development, extension and input supply, is the poorest in the EGP due to its volatile political-economic history, dependence on episodic external money and expertise and the open border with India which enables a relatively unregulated flow of seed and fertiliser, often of poor quality.

Nepal established a Technical Working Group (TWG) in the attempt to coordinate the efforts of the line departments. The TWG still lacks geographic purchase and is yet to work effectively. The TWG implements several programmes aimed at technology promotion and it has promoted several farmer groups and co-operatives, and could provide an effective starting point for the development of District Multi-stakeholder Platforms in the two SRFSI Districts, Dhanusha and Sunsari.

The B4D/Agrevolution methods could be extended from Bihar and incorporated into the Nepal SRFSI Districts.

The public extension system implemented by the District Agriculture Development Office (DADO), the SRFSI extension partner in Nepal, implements several programmes aimed at technology promotion and works through Farmer Groups. Various NGOs have also established Farmer Clubs, SHGs and Community Seed Producer Groups.

Some NGOs that focus on other regions of Nepal could also enhance the development of new poles or foci of SRFSI technologies. The NGO, FORWARD, a non-profit NGO, based in Chitwan but with projects in many Districts of Nepal, including Sunsari and Dhanusha, aims to reduce poverty levels of rural communities through integrated and sustainable development interventions, and prioritises multi-stakeholder collaboration akin to an Innovation Platform.

Manufacturing companies such as Krishna Grill and Engineering Works in Morang, Kuber and Sons Pvt Limited in Sunsari and Thapa Mould and Die located in Kathmandu Valley will be important to link with in order to replicate the India experience in Nepal and Bangladesh by developing agricultural machinery manufacturing capacity and efficient markets.

**Key Australian Programs and Projects**

**DFAT:** ACIAR and the Department of Foreign Affairs and Trade (DFAT) work closely together under the whole-of-government framework. SRFSI is one of the elements of the regional DFAT Sustainable Development Investment Portfolio (SDIP): Promoting water, food and energy security in South Asia. The foci of SDIP lie in areas where Australia has a comparative advantage such as sustainable water resources management; and in areas that are fundamental to poverty alleviation and human development, and include the development of sustainable, climate-resilient agricultural practices to improve food security and livelihoods (the focus of this project). Partnerships provide the main delivery model for Australia’s aid program in South Asia. The SDIP supports the South Asia Water Initiative (SAWI), which has ongoing studies on groundwater hydrology and groundwater usage in the EGP. The proposed project will have natural linkages with SAWI given the importance of surface and shallow groundwater for augmenting the productivity and resilience of farming systems in the EGP. This close link will continue through SDIP Phase II. As detailed below in Table 1, the outcomes sought through SRFSI variation 3 are consistent with the Australian government’s strategic level development targets (DFAT 2014).

**Table 1: Scaling project outcomes in terms of strategic level performance targets**

|  |  |  |
| --- | --- | --- |
| **Strategic Level Targets (DFAT 2014)** | | **Scaling Project Outcomes** |
| 1 | Promoting prosperity | Targeting of technological change and development of collaborative institutional networks to increase household incomes and improve livelihoods will promote prosperity for all contributing participants in the agricultural value chain. SRFSI has an annual economic benefit target of AUD1.75 billion by the end of 10 years after project commencement. |
| 2 | Engaging the private sector | Intensive private sector engagement will be achieved through structured engagement and capacity development workshops, and training on business development skills as well as through the development of institutional innovation platforms. This should lead to a market pull towards an increased demand for goods and services. The private sector fulfils a fundamental role in achieving scaling project outcomes. |
| 3 | Reducing poverty | The project explicitly targets poverty reduction among small and marginal farmers in four regions of India, Bangladesh and Nepal. These regions contain some of highest densities of rural poor in the world. The project intends to have a positive impact on 1.5 million farmers by 2021. |
| 4 | Empowering women and girls | Women farmers are specifically targeted in the scaling project, and it is intended that women constitute at least 35% of the beneficiaries and women-headed households constitute at least 25% of the households benefitted. |
| 5 | Focusing on the Indo Pacific region | The project targets four regions in India, Bangladesh and Nepal. |
| 6 | Delivering on commitments | The project will incorporate an adaptive monitoring and evaluation framework to ensure that commitments are delivered in a timely fashion and to a high standard. |
| 7 | Working with the most effective partners | Government, private sector, NGO and farmer group partners have been carefully selected, based on a thorough analysis of organisations in each of the four regions. New partners will be incorporated during project execution based on their focus, commitment and dynamism. |
| 8 | Ensuring value-for-money | Value-for-money and cost effectiveness criteria have been incorporated into the SRFSI project design. As this project builds on the outcomes of the core SRFSI project, for an Australian Government investment of AUD 2 million it is expected that by 2021 (10 years after initial investment) 1.5 million farmers will achieve an annual benefit of AUD 1000/ha and a total annual project benefit of 1.125 billion. |
| 9 | Increasing consolidation | The scaling project builds upon and amplifies the impacts of the SRFSI project, is aligned closely with national programs on scaling up, and thus achieves substantial consolidation and leveraging of investment funding. |
| 10 | Combating corruption | The project will utilise recognised Australian government fiduciary management procedures to ensure that project investments are appropriately implemented and accounted for. |

**ACIAR**: The project squarely addresses ACIAR’s primary goals of reducing food insecurity (through increased agricultural productivity resulting from technological and institutional innovation), improving livelihoods (through sustainable intensification and establishing enabling conditions for diversification into higher value crops) and improved stewardship of the resource base dedicated to agriculture (through reducing tillage and soil degradation and the sustainable use of surface and shallow ground water) in the EGP, the area with the highest concentration of rural poor in the world. Importantly this project addresses another important priorities including the empowerment of women and girls and engagement with local entrepreneurs – that all together foster adjustment of farm enterprise patterns and linkages to supporting institutions, for sustainable and resilient intensification and diversification.

In mid-2012, the **ACIAR-DFAT-CSIRO Food Systems Innovation for Food Security project** was initiated towards increasing the effectiveness of development effort to increase food security. One of FSIFS’ four areas of inquiry was into food security in the EGP and contributed to the understanding and focus of the SRFSI proposal. Renamed Food Systems Innovation (FSI) in 2013, the project has continued to contribute to the design of SRFSI’s scaling component. The scaling of SRFSI is FSI’s most advanced case study of how best to improve the effectiveness of agricultural development projects and a source of learning across Australia’s development program and partners in the agricultural and rural domain. The FSI project finished in 2015.

There are also several other closely related ACIAR projects working with CASI and water management in the EGP, listed in section 2.2. In Bangladesh, notably under the Land and Water Resources (LWR) program, considerable progress has been made with CA and small scale mechanisation, especially in the Barind Tract. In Bihar a water management project is piloting arrangements for groups of landless women to have access to land and water for vegetable production across the EGP a new project is being finalised on decision making by household women and men on CA adoption and adaptation.

## 2.2 Research and/or development strategy and relationship to other ACIAR investments and other donor activities

In this context, the proposed research addresses two main questions:

* will farm management practices based on the principles of CA and the efficient use of water resources provide a foundation for increasing smallholder crop productivity and resilience, and,
* will institutional innovations that strengthen adaptive capacity and link farmers to markets and support services enable both women and men farmers to continue to innovate in the face of climate and economic change?

**2.2.1 Research and Development Strategy**

The research and development strategy is one of participatory adaptation and intensification of farming systems by facilitating technological and institutional change that links farmers with strengthened markets for essential inputs and services. Local innovation platforms are used to assemble and organise communication and learning between participants servicing the technology, input and service market needs of farmers. Within the project, existing local innovation systems will be explored and developed in focal areas comprising approximately five communities (each of approximately 200 households) in each project districts across the region.

The scope of this project was defined in consultation with national partners and is based on a series of stocktaking and characterization exercises that were supported by ACIAR through scoping activities on farming systems and climate resilience in the EGP.[[11]](#footnote-12) All studies emphasize the potential for climate risk reduction through adaptation/adoption of zero/strip tillage (CA) cropping practices and also the development and efficient use of shallow ground and surface water resources. It is important to stress that the objective is not simply to reduce risk, but also to achieve cropping system intensification and diversification with higher levels of farmer income and investment.

The project’s **research strategy** is governed by three essential themes. First, although there is a broad understanding of the performance of the project’s prioritized sustainable intensification interventions such as CA in research stations or other parts of South Asia (see Summary of Conservation Agriculture research in South Asia – Section 8.2), specific conformation (which technological components are included and how these are combined in the system) of CA systems for the multiple smallholder environments and systems of the EGP has been little explored, especially in the stress-prone ecologies prioritized in this project. The project will determine the performance of the proposed technologies in the diverse biophysical and socio-economic systems of the target area. Second, both technological and institutional change are required to achieve agricultural transformation that increases farm incomes, creates jobs, strengthens rural economies, and addresses rural household poverty, including measures that facilitate smallholder access to inputs and services. Given this complexity, local level innovations and demonstration of the practical benefits they confer to farmers could provide the springboard for scaling up the project's results, i.e. evidence-based policy options could be formulated for the consideration of national and sub-national partners. Thirdly, knowledge gaps in decision science and scaling out methods will be addressed to accelerate progress towards the development goals of the project. For example, scaling up to policy settings and scaling out to further districts (under a potential associated project) could be synergistic pathways to extend the impact. Additional details on the project’s research strategy and areas of inquiry are given in section 4.2.

The project started with activities in eight districts in the EGP: two in NW Bangladesh, two in the eastern Terai of Nepal, and two each in the Indian States of Bihar and West Bengal. These will be the focal areas of project activities from which technology adoption will radiate. As part of pre-project activities (and part of the SRA reporting, ACIAR/CIMMYT), key informant interviews have been conducted to characterise existing water development and management institutions in these national jurisdictions and districts. Participatory rural appraisal exercises have permitted final site selection and five communities have been selected within each district, providing a total of 40 communities. These communities have been further characterised to fill specific gaps in information with particular reference to water resources and their utilization by May 2014.

As of the start of variation 3 the research activities in Madhubani district in Bihar and Dhanusha district in Nepal will be transitioned from SRFSI to the CSISA project.

The project’s **development strategy** rests on the integration of the following processes:

***1. Technology identification for different farm household types***

Further diagnostics and community consultations will be conducted to identify different farm household types and, for each type, to target opportunities for: (i) optimizing the productive use of both rain[[12]](#footnote-13) and irrigation water, (ii) ensuring timely and precise field operations through scale-appropriate mechanization and new agronomic management practices, (iii) increasing cropping intensity through diversification, timely planting, reduced tillage and supplementary irrigation, and (iv) enhancing access to, and use of, energy-efficient irrigation technologies such as solar. Together, these opportunities offer prospects of significant increases in system productivity. Table 2 shows a summary of the dominant farming systems and Appendix E (section 10) shows the EGP-Farming Systems Zone Characterization.

***2. Participatory technology adaptation***

With at least ten farmers in each of 40 communities across the eight districts, an iterative process of participatory adaptation will begin with field trials and technology demonstrations that are implemented by farmers with support from project partners. Multi-criteria technology assessments will consider disaggregated effects on women and men farmers, environmental footprint, productivity, and vulnerability to climate risks, including impacts on the stability of crop yields and profitability.

***3. Strengthening markets for goods, services, and knowledge provision***

Appropriate technologies will not be adopted unless conditions exist that permit farmers to access essential inputs and services. The project will work with an array of value chain agents and fine-tune impact pathways to ensure that the environment for innovation is favourable by developing mechanisms within each district to organise interactions, experiment with local institutional changes and assess the effect on farmer demand for, and adoption of, project technologies. The availability of equipment, such as CA seed drills/multi-crop planters and low cost irrigation pumps, will be facilitated and local agro-dealers supported to maintain supplies of necessary equipment and other inputs. Local service providers will be trained in the new technologies and in business development/entrepreneurial skills, and linked with agro-dealers and credit providers to facilitate machinery purchase. Credit providers, especially those dealing in micro-credit, will be incorporated into the local innovation systems in order to improve linkages with farmers in the project communities. Policy options that hinder or promote technological change will be identified within the innovation system and policy options assessed, discussed with policy makers in an effort to enhance adoption.

**Table 2. Dominant farming systems and tentative research foci by target area (ref to Appendix E**)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Cropping systems | Technology research | Institutions research | Local scaling out research |
| Bangladesh (NW) | Rice-rice, rice-wheat and rice-potato farming systems with limited pulse, oilseed and cash crops; low flood risk but high climate risk | Summer rice and winter crops. Replace boro(winter) rice with maize and wheat, and include legumes, vegetables and other cash crops to intensify the systems; WUE; NUE; Adapting CA. | Water management institutions to prevent over-extraction.  Government focus on replacing boro rice cultivation with alternative crops. | Led by NGO (RDRS) supported by public-private partnerships, input providers; low/high intensity ICTs, mechanization service providers |
| India - West Bengal State | Rice-wheat-jute, rice-mustard-maize, rice-rice farming systems; high cropping intensity, low productivity, low/medium flood risk, high climate risk, very low mechanization | Summer rice and winter crops, including vegetables; Improve crop management; overall mechanization; diversify boro rice; supplementary summer and winter season irrigation; WUE; NUE; Adapting CA; improve legume and oilseed production | Water management institutions for efficient energy use; Self-Help Groups and strong farmers clubs | Led by public extension supported by public-private partnerships, input providers; low/high intensity ICTs, mechanization through service providers, |
| India - Bihar State | Rice-wheat, rice-wheat-jute, rice-maize farming systems with limited pulses, oilseeds or other cash crops; low/high flood risk, high climate risk | Summer rice and winter crops. WUE; NUE; Adapting CA; supplementary summer and winter season irrigation; community water pond utilization in the north; system diversification and intensification with pulses and oil seeds. | Market access and agribusiness engagement, farmers groups,  Government focus on eastern sector. | Local entrepreneurs supported by food grain value chains, farmer-to-farmer learning, credit and insurance mechanisms, service provider mechanisms |
| Nepal Terai | Rice-wheat, rice-pulse (lentil), rice-fallow farming system with limited oilseeds or other cash crops; low/medium flood risk, poor irrigation facilities, very low mechanization and very low productivity, labour migration to Gulf countries | Summer rice and winter crops. WUE; NUE; Adapting CA; supplementary summer and winter season irrigation; improve irrigation management; system diversification and intensification with oil seeds and cash crops.; promote mechanization | Market access and agribusiness engagement, farmer Self-Help Groups | Local food grain value chains, farmer to-farmer learning, credit and insurance mechanisms, service provider mechanisms, input providers, quality inputs |

***4. Social mobilization and systemic support for innovation systems***

Initially national, state and university partners will provide the primary interface with farmers in active collaboration with ongoing livelihoods initiatives such as ~~JEEViKA and Sakhi Bihar~~ farmers or self-help groups formed by GO/NGOs in India, Nepal and Bangladesh that specialize in community engagement and have existing farmer group networks in the selected districts. Through a continuous series of capacity building activities with service providers and NGOs, the network will expand through time. The local innovation systems will be catalysed by project partners, endeavouring to incorporate all major players in the value chains of the principal agricultural enterprises in each district. With time, project partners will increasingly assume a supporting role in the innovation system in an effort to develop local competencies leading to autonomously functioning innovation systems including farmers, service providers, agro-dealers, NGOs and credit providers as members, as well as researchers and agricultural development agents. This approach is one of developing an ever-expanding network of partners focused on increasing agricultural profitability and productivity sustainably, with project support receding with time as the innovation system becomes established.

***5. Knowledge sharing and learning***

With the active facilitation of public and private sectors partners, farmer-to-farmer knowledge sharing will be an important aspect of the project’s approach to technology out-scaling. For most farmers, seeing is believing, and messages imparted by farmers have far greater impact than those coming from researchers or extension agents. From the outset farmers will be the principal protagonists in field days, a core component of our social marketing strategy, and at least 40 of which will be held in project communities in each of the first two seasons.

Opportunities for further farmer knowledge sharing will be strengthened by the development of decision support tools and information and messages compatible with massive dissemination using both conventional media outlets, such as television and radio, and modern Information and Communication Technologies (ICTs).

The fabric that holds together the multiple activities and fields of endeavour in the project communities will be the local innovation systems, incorporating farmers, service providers, agro-dealers, credit providers, researchers, extension/change agents and others who compose the major value chain actors for essential services and inputs in the targeted regions. Each partner has their own mandate, and member’s interests will be enhanced by engaging and exchanging perspectives with, and learning from, a broader set of partners, and by bringing their own particular expertise and comparative advantages to bear on overcoming bottlenecks to the productivity and profitability of agriculture in the project districts.

The project will also build on the studies, reports and synthesis produced in 2017 on mechanisation policies, gender, CA scaling, Innovation Platforms and entrepreneurship.

**2.2.2 Variation 3: Capacity Development for Scaling**

The SRFSI variation 3 activities are geared towards improving stakeholder capacities to bring CASI innovations to scale. Important stakeholders are, for example, major national and state programs who have the objective to, and means for, investing in widespread use of sustainable intensification for increased incomes. We first present CIMMYT’s approach to scaling and then the role of capacity development within that. Then the approach and activities towards capacity development within SRFSI will be described.

**Scaling of innovations**

Scaling is the process of expanding beneficial technologies and practices over geographies, across institutions and across levels to impact large numbers of people. Basically, scaling can take place at one or more (organizational) levels (horizontal or vertical scaling) or in a quantitative (expanding geographical reach) or qualitative (changing institutions) or both ways. It is important to distinguish between scaling out and scaling up. Scaling out refers to expanding the spread/reach of technologies and practices at the same level. It means increasing the quantity through processes like multiplication, dissemination and doing more of the same. Scaling up refers to institutional change within and across organizations and levels (e.g. across districts and national levels). Thus, scaling up means transforming social and institutional pre-conditions to allow efficient scaling out. This requires institutional entrepreneurship and political influence to change rules and regulations.

Given the complex environments in the countries where impacts are to be achieved processes around scaling out and up need to be planned and managed. Whereas before, scaling was considered simply multiplying what has been done (outscaling), nowadays people are more cognizant of the socio-economic and cultural context and how that affects achieving an actual impact. The PPPLab derived ten separate categories reflecting particular sets of professional activities for building a rich and effective scaling strategy (Figure 1) (Ubels and Jacobs, 2016). It reflects that scaling processes are not just replicating a single thing, but a set of arrangements; they thus consist of a set of intertwined scaling processes. Technical solutions, supply chains, financing mechanisms, policies and regulations, professional knowledge, etc., all need to be scaled in a sufficiently coherent, interrelated way in order to make something seemingly simple, such as much better agricultural practice, possible at scale. The scaling of each of these elements will also bring its own specific challenges and requirements and will require working with the specific organizations and rules of the game relevant to each element. The outer circle of the Figure indicates that breakthroughs on tough issues can be fostered by adequately using and combining the specific qualities and dynamics of business, government, civil society, and knowledge actors.



*Figure 1: Requirements for building a rich and effective scaling strategy*

CIMMYT and PPPlab[[13]](#footnote-14) , in conjunction with a local partner, will use this tool to do a rapid assessment of the scalability of CASI technologies in different environments to integrate scaling in Theories of Change (Theories of Scale) and impact pathways, and it allows to map and prioritize interventions. This will be used as a vehicle to build capacity on, and learn from, the multiple scaling processes initiated in the project. The tool should be used by project partners. The Table below shows the same categories and summarizes shortly where the SRFSI project stands at the moment.

**Table 3: Status of the SRFSI project vis-à-vis important scaling categories**

|  |  |  |
| --- | --- | --- |
| **Scaling category** | **What it provides to support scaling** | **Status SRFSI project June 2017** |
| Technology | An effective and efficient solution for the issue at stake | The CASI innovations address pertinent issues around labour shortages, water use efficiency, diversification and poverty. From the Innovation Platforms (see Box 1) it became clear that major problems yet to be addressed are energy supply, access to (quality) seeds, access to credit and pest management. Need for a FEW Nexus perspective on issues at stake is necessary. |
| Business models | An attractive financial/economic proposition for users and others | Returns to land, labor and water of CA innovations are high and growing. Zero till (ZT) wheat, maize, and lentil in India and Nepal, and Strip till (ST) maize and wheat in Bangladesh are consistently showing higher profitability and in most cases significantly higher yield performance over conventional practices (CT) with reduced water (8-64%) and energy (46-62%) costs resulted in higher profitability (16-56%) over conventional systems (Semi-Annual report 05-10/2016). Ongoing work focusses on making the technologies even more adaptable to specific sites, and making (supplementary) irrigation affordable and accessible. Suppliers of inputs, machine operators and other service providers found profitable business models around farmers adopting CASI innovations. |
| Financing | Effective financing options for users and providers or buyers | A major bottleneck for adoption of CASI innovations are the relatively high investment costs for seeding and other machines. There are limited credit services for the farmers targeted by SRFSI. Credit access is addressed through working with self-help groups/cooperatives and/or NABARD in India for example. |
| Awareness and demand | A wish and readiness for the consumer or producer to use the solution | So far about 52,000 people (farmers, service providers, etc.) have been involved in project activities (trainings, field days, etc.)(Documented on page 2 and 79 of the Semi-Annual report 05-10-2016). Dr Avinash Kishore (from IFPRI) stated in his presentation at the project annual meeting in February 2017 that despite a large number of communication events, awareness of CASI technologies is still very low, mainly because state organisations have not been promoting CASI intensively. The SRFSI team believes that when farmers hear the same message from multiple sources, they are more likely to listen to, understand, and believe in the validity of the message. Therefore, SRFSI tries to coordinate with government extension staff, agribusiness staff, and NGO staff to promote the same message to farmers. |
| Value chain development | Effective input and supply provision and other support services | Farmers in the EGP region, unlike in many other parts of South Asia, have very limited interactions with government agencies in running their farm enterprise. They depend almost entirely on private parties for securing different agricultural inputs and for disposing off produce. However, the private sector in EGP is dominated by small, informal and unorganized local players. On the one hand, they understand farmer needs well and show high degree of flexibility serving those needs. On the other hand they have limited reach and add little value. Larger, profit seeking private companies are not interested in the EGP because of the high transaction costs dealing with many small poor farmers, poor productivity, low rates of urbanization and poor connectivity (roads, etc.). Need, for example, to build capacities in governments, NGOs and communities to form (producer) organizations that can act as intermediaries between small farmers and agribusinesses as in the Innovation Platforms. (Section 9.1, Synthesis of SRFSI Socio-Economic studies- 1st draft 14 June 2017)). Quality capacity building will also reduce the risk of substandard technology being promoted. |
| Partnerships | Strategic collaboration between key stakeholders | SRFSI supported the setup of 40 Innovation Platforms across all nodes to bring stakeholders together for problem solving. However, there is still scope to engage in and facilitate strategic partnerships to multiply the reach that the project currently has. Appendix C-8.1 gives an overview of 9 priority organisations that require stronger links; all requiring capacities to collaborate. |
| Public sector governance | Enabling investment, policies, regulations and mechanisms | The EGP has been an area neglected by governments until very recently. Subsidy programs are slowly coming from the ground, but often do more harm than good because of poor targeting. Substantial capacity building, lobbying and awareness raising efforts have to be made at local, district and national governance levels. There are now some major public programs which are operational in the EGP (BGREI in India, Prime Ministers Modernisation Program in Nepal, …) where the project aims to integrate principles of scaling, sustainability and programming into. |
| Leadership managing the scaling process | Planning, lobbying and making it happen (effective facilitation of the scaling process) | Famines and chronic food insecurity that have shaped the political contours of contemporary EGP are deeply engrained on the psyche of farmers and policy makers alike (Section 3, Synthesis of SRFSI Socio-Economic studies- 1st draft 14 June 2017). Programs specifically focused on having the EGP catch up with the rest of the countries are slowly picking up speed and it is very important for SRFSI to support and catalyse their efforts. After sending policy briefs and field visits, the State Department of Agriculture in West Bengal asked the local project partners (UBKV) to put forward a proposal to scale CASI innovations to more districts. |
| Knowledge and skills | The required knowledge and professional capacity and recognition | The literacy rate in the intervention districts range from 35-82 %. Capacities for (large scale) adoption of CASI innovations are currently low, starting with poor awareness of available technologies and then proper implementation of the innovations. Given the low level of education, other non-technical challenges such as marketing, advocacy, financing, etc will be hard to tackle for farmers without additional capacity support. However, a repository of existing training materials for CASI in the region does not exist yet. |
| Monitoring and Learning | Evidence and facts that underpin and communicate the scaling ambition | Data on performance of the CASI technologies in the fields are available. A range of communication outlets are used to create awareness and share results. ICT tools (esp in Bihar) are used to communicate price and other market information. The project is currently maked the ICT tools for improved decision making available in West-Bengal and Nepal. |

In order for SRFSI to have people adopt one or more CASI technologies we have to consider the means to encourage and support other major actors in the EGP to provide them, as well as changes in the approach to serving underserved populations as part of the innovation process as well. Bearing in mind the cross sectoral and multidisciplinary processes involved in scaling, the SRFSI scaling ambitions are too big for any one institution or even group of institutions. To achieve meaningful change, researchers and development practitioners need to join forces in effective partnerships where skills and funds complement one another.

**Strategic partners for scaling**

ACIAR’s role in SDIP focuses on aspects relating to food in the context of food, energy and water interactions for improved security. Within that Nexus, it is clear that the work of other partners that focus on energy and water goes hand in hand with the work on agriculture implemented by CIMMYT, IFPRI, CSIRO, Curtin University and others. Whereas SRFSI largely focused on Farm and District level, other projects under SDIP2 will address higher level constraints (water, energy, food) to enable scaling across the project districts. It is important to note that SRFSI intervenes in the EGP, whereas SDIP targets a much wider area extending into Northern Pakistan. The systems approach creates a dependency (positive as well as negative) of the different sector projects that should be kept in mind for scaling. It is therefore important to be well informed about the status, lessons learned and pitfalls of the other projects, and vice versa. However, the most important is that the SDIP program is aligned with other initiatives aiming to improve water, energy and food securities. It requires synergies and leverage via collaborative linkages with existing policies, programs, projects and initiatives. Where there is limited coordination, or existing coordination mechanisms are not working well, such collaboration could seek to establish and/or improve coordination of effort (e.g. harmonisation of extension messages, refinement of subsidy programs). These collaborative linkages will be explicitly part of multi-stakeholders forums, and will be influential in terms of co-learning and sharing of innovation knowledge and promotion of extension messages to farmers.

The SRFSI team aims to build on existing social infrastructure and capacities for scaling out. Many self-help and farmer groups, cooperatives and federations have already been established under various mandates (government or NGO programs) and multiple extension agents are already operating on behalf of departments of agriculture and extension, agri-businesses and NGOs. We will utilise these existing groups and networks as much as possible because they also have a keen interest in the SRFSI project achieve its target

Similarly, for scaling up, it makes sense to build on existing policies, programs and projects. In terms of scaling up via policy formulation and program implementation, the collaboration with the International Food Policy Research Institute (IFPRI) under the SRFSI project has created a link to their cross-sectoral work on food, water and machinery policy - a pivotal input for developing up-scaling strategies in the EGP. The Agricultural Extension in South Asia network (AESA), which is devoted to encouraging the pluralisation and coordination of extension providers across sectors, constitutes a useful linkage for the scaling activities of SRFSI. In addition, scaling through ICT using the services that have already been developed by project partners BAU and UBKV are being explored. Collaboration with cellular providers such as the Banglalink to develop economically sustainable agricultural information services is envisaged.

**Responsible scaling**

As with any intervention, it is important to consider that scaling efforts can also have negative side-effects. For example, the promotion of solar pumps in parts of India (Maharastra) raised incomes and nutrition levels, but also led to a strong drop in the water table with detrimental consequences for other water users as well. This shows that one should critically look at what scaling processes could lead to (positive and negative) and assess their appropriateness, relevance and sustainability in the short and long term. Wigboldus and Leeuwis (2013) call this “responsible scaling”. The FEW Nexus approach in SDIP provides an excellent platform to determine the desired space for scaling- looking at the tipping points when a continued push for scaling in one direction (e.g. agricultural productivity) has negative implications for another direction (e.g. domestic water use). These interrelations in the landscape and at project level in SDIP (see Figure 2) show that scaling processes in agriculture require simultaneous scaling processes in energy and water for example as well. The theory of change of SRFSI therefore has to fit with the Theory of Change (ToC) of the SDIP program. Moreover, Wigboldus (et al., forthcoming) propose to integrate a Theory of Scaling (ToS) within the Theory of Change to explore the complexities around “how scaling happens” and related implications for the design and strategic guidance of scaling initiatives.

The ToS framework comprises five dimensions:

1. The scaling **approach** considerations: how we think about the role and function of scaling processes. This includes fundamental ideas about how change (in this case scaling) happens and ought to happen.

2. The scaling **strategy** considerations: how we think scaling can happen in appropriate and effective ways. In SRFSI this is, for example, about how we create and communicate the credibility of CASI as an improvement, and how it can be incorporated in national and state programs.

3. The scaling **narrative** articulation: how we envision a process of scaling and assumptions we make in this. This is the ToS as product and instrument which emerges from the articulation process.

4. The scaling **practice** implementation: how we organize, govern, and manage a scaling initiative in practice. In a ToC perspective, this primarily relates to inputs, activities and outputs.

5. The scaling **outcomes and impact** monitoring: how we will know about effects of scaling and what we learn about the appropriateness of chosen scaling approach, strategy, design, and scaling initiative arrangement. This also caters for a feedback loop from M&E&L.



*Figure 2: An elaborative perspective on essential dimensions of the ToS framework (from Wigboldus et al., forthcoming)*

At all dimensions, specific competencies and capacities are needed for organizations to scale responsibly, which is the focus of this variation at hand.

**Capacity Development to enable scaling**

After 3 years of implementing SRFSI phase 1 it was found that there is a large need to enhance capacities of actors in order to achieve the project targets. Strategic partners need to enhance their capacities to accelerate awareness raising on CASI, improve proper application of CASI and to enable sustainable and responsible scaling of CASI innovations, for example. Quality capacity building will also reduce the risk of substandard technology being promoted with reputational damage as only one of the dangers involved. Variation 3 aims to change behaviour at partner and institutional level directly, and indirectly at the level of farmers. We want partners not to limit their focus on farmers alone, but support them influence national/state programs and other organisations to work much more strategically towards a scaling agenda. This, however, requires capacity building on “new” topics such as partnerships, lobby and advocacy, finance, communication/awareness. Capacity Development (CD) is a crucial and strategic enabler in the complex process of achieving development outcomes through research (CGIAR, 2015). CD occurs across multiple levels—individual, organizational and institutional—and covers a wider scope than the mere transfer of knowledge and skills through training. More often than not, there is simply an implicit assumption that strengthening the competencies of individuals will enhance the capabilities and capacity of organizations, which in turn will contribute to the emergence of capacity of the system (TAP, 2016). Individual capacity development should not be attempted without also looking at the organizational setting for the individual(s), and where appropriate integrating organization-level CD (Almond and Kisauzi, 2005). For example, local NARS should be supported to set incentives for local scientists to stay in the country after receiving high level education. CD of each dimension has to be dealt with in its own right, through multiple but complementary pathways for change. CD at institutional level recognizes social, cultural and political structures in which power relations, social and institutional dimensions determine opportunities for different groups of actors in initiating an innovation niche and acting upon the interventions to attain sustainability. As responsibilities for out-scaling and up-scaling are passed on to local partners there will be a need to develop their management skills, and skills resource mobilization and partnership building (Almond and Kisauzi, 2005). Figure 3 shows the multitude of dimensions in CD and the strong links between the different levels. In the context of SRFSI the focus is on the local level, such as district administrations, local entrepeneurs and other local organizations.



*Figure 3: Three dimensions of Capacity Development (CD) and what they aim to improve*

This reflects the idea that a system wide approach is needed to catalyze broad change to agricultural production and foster a collaborative environment in the EGP, and to ensure continued learning beyond the project. CD takes place within an overall environment that requires constant adaptation to internal and external contextual changes. Capacity development in short- to medium-term timeframes must integrate with long-term strategies. Experience and evidence shows that capacity building initiatives most often die at the end of programs and projects unless the processes for keeping them going have been put in place at the outset (RIU, 2005). Hence, it is important to plan strategically where CD fits within an overall scaling strategy and target the right people and organizations. Important stakeholders and relevant topics are:

* Partners (NGO, University, Extension)- focus capacity development on organizational development, scaling strategies, process documentation, training capacity and quality, etc. to equip the partners to scale CASI beyond the project lifetime.
* Existing and new service providers- value chain and business model development, improved service delivery to farmers (finance, training, inputs), promote linking up with new/different partners (chamber of commerce, banks, etc.).
* Decision makers- awareness of problems and solutions around CASI, program design, theories of change and scaling, PPP, institutionalization, etc.
* Farmers- reached through partners with training on access to markets and services, organizational development, etc.)

Strategic questions for CD for putting research into use are:

* What knowledge and skills are needed?
* Who should have the skills and opportunities?
* What should organizational and institutional arrangements look like?
* What networks and linkages will be productive?

The activities to implement this strategy on CD for scaling is described in Section 5- Operations.

**2.2.3 Relationship to other ACIAR and DFAT investments**

**DFAT:** The Sustainable Development Investment Portfolio (SDIP), is one of two programmatic approaches under the Australian Government’s regional development program in South Asia. The objective of the South Asia regional program is to strengthen trans-boundary cooperation to promote more inclusive, accelerated and resilient growth in South Asia. More specifically, the SDIP’s objective is to increase water, food and energy security in South Asia in order to facilitate economic growth and improve livelihoods, targeting the poorest and most vulnerable, particularly women and girls.The SDIP is a 12 year Australian Government initiative, with around AUD 50m secured for the first 4 years. SRFSI is a core project in the agricultural pillar of SDIP and its M&E data will form a component of SDIP M&E reporting.

**ACIAR:** Many ACIAR-funded projects in the IGP have addressed CA and have contributed to the transformation of agriculture in the north-western IGP. Some of these projects are ongoing and the proposed project will establish links with the following:

* Land & Water Resources/2012/079: *Improving dry season agriculture for marginal and tenant farmers in the Eastern Gangetic Plains through conjunctive use of pond and groundwater resources.* This project, led by the University of Southern Queensland, is considered SRFSI’s sister project and will share research sites, data and project staff. It is expected that prior to the commencement of the Variation 3, water management technologies will be identified between SRFSI and LWR/2012/079 that will be appropriate for integration within scaling initiatives.
* The project CIM/2007/122: The results of *Sustainable intensification of rice-maize production systems in Bangladesh* has been developing rice-maize systems which also have relevance to other similar parts of EGP. This project ended in 2013, and relevant elements of the research, as well as some of the research team, are incorporated into the SRFSI. In relation to good rotations, increased cropping intensity and diversification, links are established with CIM-2009-038*: Introduction of short duration pulses into rice-based cropping systems in western Bangladesh*.
* The project, LWR/2010/080 *Overcoming agronomic and mechanisation constraints to development and adoption of conservation agriculture in diversified rice-based cropping in Bangladesh* has much relevant experience for sharing with the region. Four of the five objectives of LWR/2010/080 will also be addressed within the SRFSI project across the EGP and the fifth objective of LWR/2010/080 – the design (and development) of minimum tillage planters – will feed directly into the SRFSI field work, providing prototypes to be evaluated under different conditions of the EGP. The domain of LWR/2010/080 covers part of the same and neighboring districts to SRFSI focus districts in northwest Bangladesh, and linkages and knowledge sharing between the two projects will complement and enhance both projects. While the project is now finished, the Versatile Multicrop Planter (VMP) developed by this project will be one of the machines used by scaling partners in Variation 3. The Conservation Agriculture Service Provider Association (CASPA) the project helped create is a potential partner of Variation 3 under the Strategic Grant Scheme.
* SRFSI can also benefit from the experience with farmer climate clubs, farmer typologies and crop modelling of the project LWR/2008/019: *Developing multi-scale climate change adaptation strategies for farming communities in Cambodia, Lao PDR, Bangladesh and India.*
* LWR/2012/079: *Improving smallholder livelihoods with small scale irrigation in India and Nepal*. This project will provide basic research on systemic issues such as land tenure and effects of migration (feminisation, labour shortage and remittances) and technological research in development of low cost pumping and irrigation options to address the reality of multiple uses of water supplies and small scale water supply options, especially domestic and agricultural needs of women. This project will also evaluate surface and groundwater resources at the meso-level in the EGP and will initially focus its efforts on the eight districts in the EGP where SRFSI will concentrate. SRFSI will coordinate with the LWR project to define methodologies for water resource studies in the project communities, and the detailed data from these communities will feed into the district and regional level studies of the LWR/2012/079 project. These projects will have strong links with some shared staff. However, although SRFSI will benefit from the information and knowledge developed under LWR/2012/079, and the contextual importance of SRFSI results will be enhanced by the larger-scale water balance studies of the LWR project, SRFSI does not depend on the LWR project for its success, and can produce all of the planned outputs independently.

The SRFSI will cross-fertilize and harmonise strategies with other SDIP partners (see above in relation to the role of Australian Aid) and the SRFSI Project Leader participated in the SDIP annual meeting held in Canberra in February, 2014.

* SRFSI will also work closely with the Food Systems Innovation for Food Security project (FSI-2).  SRFSI will be one of the platforms observed, analysed and supported by FSI-2 for learning about the application of best practices in food security innovation. In the process FSI-2 will provide supplementary analytical, learning and capacity building support to SRFSI. This support will be determined by emerging needs of the SRFSI, and could include strengthening the learning and capacity building capabilities of water management institutions in the EGP.  In this regard, the FSI-2 project is expected to assess meso-level water management institutions and scaling out institutions in early 2014 and support capacity building on M&E.  The South Asia component of the FSI project will be invited to participate in key SRFSI workshops and Steering Committee events to encourage close contact and coordination.
* The SRFSI project will benefit from linkages with scientists in the EGP trained in the use of APSIM through CSIRO’s ACIAR-funded project (LWR/2010/033) with the South Asian Association for Regional Cooperation (SAARC). This project aimed to develop systems analysis and modelling capacity within SAARC agricultural research organisations and thereby allow them to undertake more effective research, capacity that will be sought for incorporation into the SRFSI modelling and scenario analysis activities.

The project will monitor and pursue opportunities for linkages with new projects initiated under Australian Aid’s Sustainable Development Investment Strategy (SDIP) and other Australian initiatives.

The implementation of the SRFSI projects opens up the possibilities of high return investments in widespread scaling out of the project technologies, beyond the initial eight districts targeted by SRFSI. The SRFSI will not only generate and demonstrate sustainable and profitable intensification practices, but will also identify farm household typologies and decision criteria and institutional innovations that will enable the effective scaling out of technologies.

**2.2.4 Relationship to other donor activities**

The project is clearly aligned with the scope of four of the CGIAR Research Projects (CRP) – Maize, Rice, Wheat and “Climate Change, Agriculture and Food Security (CCAFS)”. CIMMYT staff in the region are currently working on three of these Programs and have established links with IRRI staff working on the Rice CRP (See Section 8.9). Much of this work will provide useful inputs into the SRFSI and linkages with these projects will be maintained by the project leader. In the Maize CRP there are reciprocal linkages with consortium activities on, especially, three of the Strategic Initiatives – SI 1: Socioeconomics and policies for maize futures; SI 2: Sustainable intensification and income opportunities for the poor; and SI 3: Smallholder precision agriculture; while in the Wheat CRP the SRFSI project is linked especially to the Strategic Initiatives SI 1: Technology targeting for greatest impact; SI 2: Sustainable wheat-based systems; SI 3: Nutrient- and water-use efficiency; and SI 10: Strengthening capacities. The CRPs are also heavily engaged in developing adequate germplasm for the South Asia region and new varieties emanating from the CRPs with improved pest resistance, productivity and resilience to climatic stresses, will be incorporated into the field studies and out-scaling activities of SRFSI. Under the Rice CRP (GRISP) CIMMYT will work with IRRI on refining nutrient management decision support tools, and SRFSI will also link with ongoing CIMMYT activities under the CCAFS CRP on understanding farmer typologies in Bihar, on barriers to adoption of climate-resilient technologies, on maize value chains and greenhouse gas (GHG) emissions under conservation agriculture, as well as following and incorporating messages from the “climate-smart villages” developed with the CCAFS CRP into the SRFSI agenda.

Bangladesh and Nepal attract more international donor funds to address poverty and food and nutritional insecurity than does India, which relies more upon national funding. At the regional level there are a variety of relevant initiatives with which SRFSI is partnering, or with whom partnerships could be developed to leverage scaling effort.

Through the SRFSI executing organization, CIMMYT, the scaling component of SRFSI will have strong linkages and share knowledge with four of the **Consultative Group on International Agricultural Research (CGIAR)** **Consortium** **Research Projects (CRPs)** concerning maize, rice, wheat and “Climate Smart Village/CCAFS)”. The CRPs are engaged in developing germplasm and crop management technologies for the South Asia region, including new varieties with improved pest resistance, productivity and resilience to climatic stresses. Under the Rice CRP (GRISP), CIMMYT is working with IRRI on refining nutrient management decision support tools. Within the Maize CRP, relevant Strategic Initiatives include: Socioeconomics and policies for maize futures (SI 1); Sustainable intensification and income opportunities for the poor (SI 2); and Smallholder precision agriculture (SI 3). Within the Wheat CRP, Strategic Initiatives include: Technology targeting for greatest impact (SI 1); Sustainable wheat-based systems (SI 2); Nutrient- and water-use efficiency (SI 3); and Strengthening capacities (SI 10). Within the Climate Change, Agriculture and Food Security(CCAFS) CRP, relevant research priorities include: Gender and Climate Change; Weather index based insurance; Climate food and farming networks; Analysis of national adaptation policies and institutions; Climate Smart villages; Climate services for smallholder farmers; Systemic Integration Adaptation; Farms of the future and Climate Analogues.

**USAID: Rural Business Hubs project, India**: By establishing a ‘one stop shop’ that connects farmers to products, markets, information, and advisory services, the Confederation of Indian Industries (CII) implements the *hubs to* empower farmers to participate in profitable agricultural markets. The hubs integrate small-scale and marginalized farmers into the market to better increase their returns. Lessons learned from this activity will provide a model that can be replicated elsewhere in India and abroad.

**Bill and Melinda Gates Foundation and the United States Agency for International Development (USAID):** The Cereal Systems Initiative for South Asia (CSISA) is a large regional project supported by the Bill and Melinda Gates Foundation and the United States Agency for International Development (USAID) that has activities in Bangladesh, India, and Nepal. CSISA was established in 2009 to promote durable change at scale in South Asia’s cereal-based cropping systems and supports regional and national efforts to improve cereal production growth in South Asia’s Indo-Gangetic Plains. It operates in rural ‘innovation hubs’ in Bangladesh, India and Nepal. Consolidation of the CSISA experiences in policy relevant formats forms an important opportunity for scaling SRFSI. The CSISA work was important to the building of CA machinery manufacturing capacity in Bangladesh. CSISA involves more than 300 public, civil society and private sector partners in the development and dissemination of improved cropping systems, resource-conserving management technologies, new cereal varieties and hybrids, livestock feeding strategies and feed value chains and policies and markets. CSISA is run by a collaboration of three international agricultural research centers, all members of the CGIAR, and each with a distinct but complementary expertise in agricultural production systems. Overall management of CSISA is provided by CIMMYT, while the International Rice Research Institute (IRRI), and the International Food Policy Research Institute (IFPRI) address important R&D components of the project. CSISA utilizes strategic partnerships, participatory technology development, future-oriented cropping systems research, and capacity building to catalyze locally-appropriate, sustainable change in rural communities across the region. In India CSISA focuses on central Bihar and Orissa, while SRFSI focusses in northern Bihar and West Bengal, in Bangladesh the focus of CSISA is principally in southern Bangladesh with other hubs in Dinajpur, and SRFSI concentrates activities in Rangpur and Rajshahi, and in Nepal CSISA focuses on the western Terai and SRFSI on the eastern Terai. Please find a map of intervention areas of SRFSI and CISA in the region in Appendix F. Activities in the two projects are extremely complementary. CSISA has developed a number of training modules and publications that are relevant to, and will be used in, capacity building activities undertaken in the scaling component of SRFSI. CSISA and local partners (ICAR, JEEVIKA) will take over some of the research activities of the last part of the SRFSI project.

**Small Farm Mechanisation and Surface Water Irrigation Project**: In Bangladesh, **CIMMYT** leads a project on surface water irrigation and small-farm efficient mechanization and local service provisions (CSISA-MI) closely aligned with the CSISA project. This project, in which CIMMYT partners with International Development Enterprises (IDE), focusses on adapting and developing small farm CA and irrigation equipment which will provide important technological and capacity building inputs to the main SRFSI project and the scaling component.

**The South Asia Water Initiative (SAWI)** is funded by the World Bank, the Global Environment Fund, the Australian Department of Foreign Affairs and Trade (DFAT - Australian Aid) and the British Department for International Development (DFID). SAWI will provide the project with basin-scale hydrological and economic scenarios to complement field-scale inquiry.

**GIZ- German Development Cooperation- Energizing Development (EnDev)** with office in Delhi promotes the ‘Powering Agriculture – Sustainable Energy for Food’ of the German International Development Agency (GIZ on behalf of the German Federal Ministry for Economic Cooperation and Development) initiative. It seeks to support the introduction of Solar-Powered Irrigation Systems (SPIS) as one technology option to sustain and increase agricultural production in developing countries. Pilot sites in Mali, Ghana and India-Bihar- are set-up. A manual was developed with up-to-date information on the technology and methods of promotion, as well as how to finance SPIS. Furthermore, it gives insight in how SPIS is designed, set up and maintained. It is accompanied by a set of tools, such as maintenance check lists, data collection guidelines and design calculations. The manual and tools are targeting stakeholders who give advice to, or finance, medium sized agricultural enterprises. These are agricultural (irrigation) extension advisors and credit officers / risk managers in financing institutions.Training materials and networks to key players in solar powered irrigation are available for sharing.

SRFSI will consistently pursue linkages with national and state initiatives with complementary objectives, such as the ICAR CA initiative, BGREI, NICRA, National Food Security Mission and Ratriya Krishi Vikas Yojana initiatives in India and similarly in Bangladesh and Nepal (See Section 2.1).

CIMMYT will continually monitor the panorama of projects being conducted in the EGP to identify beneficial linkages for both conducting the SRFSI and for scaling up and scaling out SRFSI technologies and methodologies through Capacity Development.

# Objectives

## 3.1 Aim and objectives

The overall aim of the project is to improve the productivity, profitability, and sustainability of smallholder agriculture in the EGP by activities carried out to address the following objectives:

1. Understand **farmer circumstances** with respect to cropping systems, natural and economic resources base, livelihood strategies, and capacity to bear risk and undertake technological innovation.
2. Develop **with farmers more productive and sustainable technologies** that are resilient to climate risks and profitable for smallholders.
3. Catalyse, support and evaluate i**nstitutional and policy changes** that establish an enabling environment for the adoption of high-impact technologies from Objective 2.
4. **Facilitate widespread adoption** of sustainable, resilient and more profitable farming systems.

By 2021, evidence based pathways will be developed that would lead to 1.5 million farming households adopting at least one or more CASI technologies that improves farmer livelihoods, reduces poverty and is more sustainable than current practices. The target group for this livelihoods improvement is smallholder farm households, including female-headed households. SRFSI relies on local partners to reach out to the target group and on synergistic effects of Variation 3.

## 3.2 Update on achievements

At the time of writing Variation 3 of SRFSI, the project still has 1 year before completion. The bulk of activities took place at farm and community level. The following has been achieved (derived from the semi-annual report 2016):

Objective 1 is largely completed. Pilot communities in 8 districts have been identified and characterized. Principal problems are labour shortage, cost and time for production and profitability. In addition, the assessment of access to and use of water for (supplementary) irrigation concluded that farmers rely largely on groundwater for irrigation, and that there is a growing competition for surface water resources for community consumption and fishing.

Objective 2 is largely completed. However, there is more to do to produce evidence for policy concerns around food, energy and water (FEW) nexus to inform policy makers better. Multi-year evaluations from demonstration sites allowed for a participatory assessment of costs, benefits and climate resilience of a range of CASI innovations. This included the testing of local prototypes of small tractor implements, mechanical rice transplanters, laser levelling of small fields, etc. Returns to land, labor and water of CA innovations are high and growing. Zero till (ZT) wheat, maize, and lentil in India and Nepal, and Strip till (ST) maize and wheat in Bangladesh are consistently showing higher profitability and in most cases significantly higher yield performance over conventional practices (CT) with reduced water (8-64%) and energy (46-62%) costs resulted in higher profitability (16-56%) over conventional systems. Work on the use of ICT supported tools for improved decision making still remains under this objective.

Objective 3: Comprehensive surveys were performed on farmer perceptions on reasons for adoption, and in the coming months the influence of particular institutional settings on farmer decision making will be assessed. 40 Innovation platforms have been set up and 34 of them are active. It was found important to strengthen existing stakeholder platforms rather than creating new ones. Service providers (e.g machinery) are supported with private sector engagement approaches through Business for Development (B4D) – an Australian based private sector NGO- on business model trainings, networking events and development of policy roadmaps to facilitate market access.

Objective 4: Focussed on learning modules for technology validation, exposure and capacity building of beneficiaries. Around 35,000 beneficiaries participated in SRFSI events. Capacity building for local change agents, service providers and agro dealers focussed on business development services, farm knowledge development, market intelligence, and crop and irrigation management. In addition, field days and exchange visits were organized for farmer-to-farmer exchange.

## 3.3 Revision of sub-objectives under Objective 4

The sub-objectives under Objective 4 “**Facilitate widespread adoption** of sustainable, resilient and more profitable farming systems” have been subject to change for the last 2 years. Since Variation 3 focus on capacity development (especially of major national and state programs (BGREI, State Dept. of Agr. Extension) for scaling there is a need to revise the formulations in the original proposal. It is however important to accommodate the achievements made (and still ongoing) of the project. According to the semi-annual progress report 05-10/2016 sub-Objectives 4.1 (apart from a Technical Bulletin summarising achievements) and 4.5 have been completed. Given the clear focus on capacity development in sub-objectives 4.2 to 4.4 it is proposed to leave the formulation of the sub-objectives 4.1 to 4.5 unchanged. However, the activities under the sub-objectives are adapted to accommodate for an inventory of CD measures, CD needs assessment and the development, implementation and monitoring of the CD measures and resulting adoption. These are described in Section 5.

# Planned impacts and adoption pathways

Multi-stakeholders forum are the fundamental organizational and operational concept underlying most of CIMMYT’s ongoing farming systems work in South Asia and elsewhere. This concept implicitly recognizes that achieving durable change with farmers is not a single act of technology introduction but rather an amalgamation of linked activities that require new interactions and coordination, involving not only agricultural technology but also, importantly, supporting institutions and policies. To identify and make progress towards geographically-differentiated priorities, needs, and opportunities, within each district a wide range of partners are brought together, optimally including representatives of private-sector companies involved in the supply and marketing of agricultural inputs and services, processing facilities, equipment manufacturers, credit providers, public-sector research and extension agencies, universities, cooperatives, water management associations, NGOs, and farmer groups, as well as others that may be locally important to overcome bottlenecks in the principal local agricultural value chains.

At its base, the SRFSI project’s impact logic, shown with illustrative connections between outcome classes, is grounded in the local innovation system in the district. Within the innovation system, farmer participatory research and capacity development is an essential step towards prioritizing and refining technologies adapted to farmer circumstances (ascertained in Objective 1: Understand farmer circumstances with respect to cropping systems, natural and economic resources base, livelihood strategies, and capacity to bear risk and undertake technological innovation) in specific production ecologies thereby catalysing farmer experimentation with these technologies (**Outcome 1 of the original project**: ‘Farmers test risk-reducing and productivity enhancing technologies”, will result from the achievement of Objective 2: Develop with farmers more productive and sustainable technologies that are resilient to climate risks and profitable for smallholders).

In the relatively impoverished EGP, it is unrealistic to expect that large numbers of individual farmers will have the capacity to invest in the types of machinery that can substantially increase climate-resilience through timely planting, practice of CA and precision agriculture and supplementary irrigation. By supporting the emergence of service-provider entrepreneurs, this project will help access to more sustainable farming systems (by lowering access barriers to agricultural inputs, especially system-specific inputs, e.g. efficient pumps, zero-till drills, fertilizers, etc.) by a wide range of farming households with variable portfolios of livelihood assets (**Outcome 2 of the original project**: ‘Inputs and mechanized services for prioritized technologies broadly available in target districts’ will result from activities under Objective 3: Catalyse, support and evaluate i**nstitutional and policy changes** that establish an enabling environment for the adoption of high-impact technologies from Objective 2). The emergence of service providers will not only improve broader-based access to technological innovations, but will also be a primary conduit for achieving impact at scale without the challenge of reaching individual farming households.



*Figure 4. Project goal, intermediate outcomes, and associated outputs.*



*Figure 5. Representation of the SRFSI impact pathways within an innovation system.*

Concurrently the different agents of the innovation system, representing if possible all major components of the primary local agricultural value chains, together with innovative farmers, work to identify and overcome other bottle-necks to system productivity, sustainability and resilience (**Revised Outcome 3**: The institutional and policy environment is conducive to large scale adoption of CASI.

Novel approaches to facilitate farmer-to-farmer knowledge exchange will be initiated in the project, and will be continued and expanded in Variation 3, including the utilization of social marketing to increase awareness and generate even greater demand for climate-resilient technologies. (**Revised Outcome 4:** ‘Key stakeholders are empowered to support large scale adoption of CASI). Achieving the potential of Outcome 4 will depend on further investment in the out-scaling and up-scaling process and associated capacities required to do so. One key, however, to the longer-term impact derived from the project’s investments is through training (i.e. ‘up-scaling’) in participatory methodologies for NARES partners.

The project’s impact pathway is illustrated in Figure 5, which assumes that all players are linked through the local innovation system. Major impact from the project will result through the funding of further scaling activities.

## 4.1 Scientific impacts

The project intends to significantly add to scientific knowledge in the following areas:

**A. Farmer circumstances, typologies, production ecologies, and technologies for resilience**

Past efforts under the rubric of ‘sustainable intensification’ in the IGP have tended to lump communities and technologies into broad classes such as ‘small farmers’ and the so-called ‘resource conserving technologies’ without sufficient recognition that farmer’s needs are differentiated and that the performance of promising technology interventions are not uniform in time or space. To permit a targeted approach that will facilitate innovation and impact, the following analysis will be prioritized:

1. **Farmer circumstances and systems characterization for resilience**: what biophysical and socio-economic characteristics unite and segregate different types of farmers, including importantly women farmers, with respect to climate vulnerability and plausible pathways towards resilience? Can farmers be grouped into clear typologies? What levels of social organisation/networks are present, and what are the opportunities for building social capital in farmer groups for institution building, farmer-to-farmer extension, and local innovation, adaptation and adoption?
2. **Characterisation and assessment of innovation platform methodology in terms of up- and out-scaling via socio-technical innovation and development of evidence based policy roadmaps**: does use of the Agricultural Innovation System approach to agricultural development, involving both technical and institutional innovation, improve pathways to impact?

**B. The impact of conservation agriculture and supplementary irrigation on farm productivity and the natural resource base in the EGP.**

1. **Performance and performance variability of climate resilient production technologies**: risk, yield and profitability of key technologies (e.g. CA; directly sown/transplanted unpuddled rice; diversification away from winter (boro) rice; additional winter crops including legumes, oilseeds and fodder crops; laser levelling; improved mechanization etc.) assessed across sites and years to elucidate the distribution of benefits expected for different groups of farmers.
2. **The effects of these same technologies on soil quality**: the longer-term benefits of sustainable farming practices on the natural resource base will be monitored to further advance the understanding of the effects of conservation practices on the fundamental processes underlying soil quality, including potential negative effects such as herbicide accumulation and leaching.
3. **The effects of improved soil structure on rice culture:** rice is traditionally grown in soils with developed hard pans to restrict water percolation. Improved soil structure, the absence of soil puddling and the expected increased soil biological activity will undoubtedly increase water infiltration and drainage rates necessitating fundamental changes in rice irrigation and production methods.
4. **Development trajectories:** some adaptation strategies (e.g. energy costs associated with irrigation; increased herbicide and/or nutrient applications etc.) can generate additional greenhouse gas emissions. The climate footprint of different production technologies will be evaluated with a carbon accounting framework.

**C. Decision processes and enabling factors for innovation**

Even when ostensibly ‘good’ technologies have been identified and matched to specific production ecologies, uptake is not guaranteed. Farmers have their own priorities and decision criteria (both objective and subjective) that are often quite distinct from simple yield and profit metrics that researchers use to evaluate technologies, and local institutional arrangements also have important influences on farmers’ decisions. Farm household decision-making processes have enormous implications for the adoption and adaptation of water and CA technologies. To that end, the following research themes will be prioritized, including a consideration of enabling factors that facilitate innovation by influencing decision processes:

1. **Risk and willingness to invest**: The level of risk-averseness will be estimated for different types of farm-households including women farmers, taking account of the socio-economic, biophysical, and policy circumstances that influence risk bearing capacity. The relationship between household risk preferences, potential benefits from technology and farm improvement and farmer investment will be analysed.
2. **Literacy, numeracy, and social capital**: quantifying how decision processes by farmers, including women farmers, emerging entrepreneurs, and other ‘non-traditional’ audiences are supported by knowledge networks and formal extension to facilitate innovation[[14]](#footnote-15).
3. **When does it pay to diversify, with and without adaptation?** Farmers can cope with climate-based production threats by adopting new technologies but also, in some instances, by system diversification (e.g. maize for wheat or rice, vegetables for pulses) that can allow farmers to better cope with institutional and market risks. However, diversification can bring its own set of challenges, including higher levels of market volatility. This project will consider the impact of different scenarios (yield, climate, commodity and input prices, wage rates, procurement policy, interest rates, subsidies, etc.) on the benefits of diversification for different types of farmers, with and without technological adaptation.

**D. Scaling factors and drivers of adoption**

Identifying adapted technologies and the enabling factors that facilitate innovation are pre-conditions for achieving the goals of the project, but insufficient for achieving impact *at scale.* Research on scaling processes and outreach methods will be initiated in the SRFSI project. This research will inform the implementation modalities of both projects with respect to accelerating patterns of technology uptake.

1. **Knowledge investments, social change and technology adoption**: how much and in what form (e.g. traditional extension, construction of social capital and farmer-led extension, combined approach) must knowledge of new technologies be provided to mobilize behavioural change among large numbers of farmers? What critical knowledge for scaling is available and what is missing? How effective are various CD measures?
2. **Market integration and technology adoption**: how do commercial pocket development (as promoted by the NGO partner iDE) and existing variations in market integration affect knowledge dissemination and the availability of critical services and inputs for prioritized climate-resilient technologies?
3. **Leveraging ICTs and decision**: how can past and projected climate information be translated into practical recommendations for farmers through existing decision support frameworks?
4. **Policy dimensions of water resources development and sustainable use**: what are potential policies and institutional arrangements that promote climate change adaptation while minimizing externalities including GHG emissions and unsustainable water extraction rates?

## 4.2 Capacity impacts

The different capacity building activities planned in the project as part of the impact pathway (Theory of Change), summarised in the following list, will result in large numbers of people with improved capacity to adapt to climate variability and change.

* **NARES Partners**: Efforts to strengthen the capacity of researcher and extension (change) agent partners in the target districts will begin at project inception with a week-long course held in each country. The course will cover farmer participatory research, the principles of innovation systems and community involvement, strategies for building social capital in farmer groups, gender sensitivity, the management of on-farm research trials and demonstrations, the principles and practical implementation of CA and associated precision agriculture tools, and supplementary irrigation, all topics which remain only partially understood in most of the target region. CIMMYT and partners have already developed a wealth of materials to support capacity building efforts that will be fully leveraged within the scope of this project (see: <http://www.knowledgebank.irri.org/csisa/>). The IRRI-CIMMYT ‘cereal knowledge bank’ architecture will continue to be utilized to archive and curate outreach materials. Crucially, methods for providing extension support and business development services to mechanized service providers and agro-dealers (i.e. ‘change agents’[[15]](#footnote-16)) as well as for facilitating farmer-to-farmer knowledge exchange will also be highlighted. (75+ people)
* **New model of joint institutional and technological development**: The capacity of NARES partners to evaluate progress towards development goals by understanding the impact of institutional settings upon technology adoption will be developed through training and mentoring by CGIAR and Australian scientists, employing impact pathways and adaptive Monitoring and Evaluation (M&E) as learning tools.
* **CA Technical “Champions”**: The most promising young partners from each district will have opportunities for advanced skills development at the 3-week CA training course held by CIMMYT in NW India (4 States/Countries x 3 years = 12 people trained), and

The most outstanding participants from the above courses will attend the six-week CA training course in CIMMYT, Mexico. This has proved to be a ‘life-changing’ event for many young scientists as they are outside their culture and interacting with their peers from all over the world (3 people trained).

* **Mechanized Service Providers and Input Dealers**: 2-day courses on new climate-resilient technologies for mechanized service providers and agro-dealers will be conducted in each district during the first two seasons. Initial courses will be conducted in Nepal and India by iDE together with CIMMYT, and this model replicated in Bangladesh with support from iDE Bangladesh. Courses will focus on CA and precision agriculture, small machinery, irrigation, and the facilitation of farmer knowledge-sharing as an essential element of building demand for new technologies and services (2 seasons x 8 districts x 25 people = 400 people trained).
* Additionally, two advanced courses, each for approximately 10 service providers, will be held in each district in 2014/15 and will emphasize business development services for CA and irrigation entrepreneurs. (2 courses x 8 districts x 10 persons = 160 people trained).
* **Farmer-to-Farmer Knowledge Exchange**: Farmers typically learn best from their peers, but this reality is rarely leveraged in agriculture development projects that often rely exclusively on ‘expert’-driven approaches. With facilitation and back-stopping by NARES and private sector partners, the project will build capacity for farmers to play the lead role in field days. There will be at least one field day per community in the 2014 summer season and another in the 2014/15 winter season each catering to more than 100 farmers (5 communities x 8 districts x 100 farmers= 4000 farmers per season). Numerous field days each season in each of the eight districts are foreseen under the associated out-scaling project, which will also develop opportunities for farmers from more distant communities to observe and discuss technological and institutional innovations with farmers in the SRFSI focal communities through 2-day exchange visits.
* **International Collaboration and Knowledge Sharing**: The capacity of NARES partners involved in the project will be further enhanced through mentoring from CGIAR scientists and Australian scientists from CSIRO and Australian universities. Study tours of all project sites each season, together with annual evaluation and planning meetings, provide an additional vehicle for shared learning and capacity building.
* **Capacity development through the institutional action research program:** Institutional research (especially at local level) within the project will adopt an action research approach, whereby the learnings from the analysis of multi-stakeholder forum networks are fed back to the groups and networks (including via focus group discussions) to enable constructive learning within and continuous improvement of performance.
* **Informal capacity development through participation in multi-stakeholders forum:** Participation in the deliberations within Innovation Platforms and other multi-stakeholder forums, is a powerful informal learning process. Hereby different sectoral participants from government, the private sector, NGOs and farmer groups, begin to understand the values, needs and interests of other sectoral partners, envisage their collaborative role in the innovation system, and develop innovations themselves, whether they be technological, market or institutional. The cross-fertilisation and co-learning impacts through informal processes are likely to exceed those of more formal structured capacity development interventions.
* **Capacity building for scaling** not only refers to scaling the capacity building to more beneficiaries but foremost to adding capacities that are needed to take CASI innovations to scale within and beyond the project lifetime. A scaling tool kit will be developed that will help partners better plan and implement scaling initiatives (e.g. rapid scaling assessment, learning material repository, etc). This may require working with different stakeholders on different topics, which is at the core of the SRFSI Variation 3.
* **Capacity building for the Rabi season 2017/18:** a concerted effort to answer to the growing demand from partners for training on improved production and marketing for the lucrative Rabi season. Farmer-to-farmer learning, field demonstrations, field days/fairs, cross visits will be important to expose and convince stakeholders of the value of CASI technologies.

The focus of Variation 3 is on capacity development for scaling. Capacity development efforts will focus on closing capacity gaps required for maximum responsible scaling of CASI innovations. It is anticipated that the SRFSI team and partners could prioritise CD on business model training to increase the impact from private sector actors (agri-business, service providers), on strategic partnerships to improve and rationalise ways of collaboration, and farmer organisation and institutionalisation. All CD materials will be available to anyone interested. The impact of a concerted push to enhance capacities of a range of stakeholders involved in SRFSI will not only benefit the project but also impact society as a whole.

## 4.3 Community impacts

Especially among smallholder farmers, community involvement is crucial to successful technology change, as social structures in the community often make it exceptionally difficult for a farming household to innovate without some measure of hostility, ridicule or jealousy. For this reason, the SRFSI will prioritize community consultations at the project onset. Importantly, the community will be consulted on the choice of collaborating farmers for the on-farm research and demonstration process, helping ensure that representative, communicative and trusted farmers are involved.

Commercial development at the local level can have transformative effects through increased input availability, income generation from sales of surplus production, and as convening points for knowledge and service provision where farmers naturally congregate. This project will endeavour to strengthen existing commercial systems for agricultural inputs as well as work to form new commercial ‘pockets’ in areas where they do not exist. Entrepreneurship and business development training is essential for the latter, and will be provided to community leaders who want to form independent or collective enterprises. Leaders of women’s self-help groups (SHG) will be targeted for the latter.

The feminization of agriculture in the EGP has become notable. Dr. Lahiri Dutt’s survey of women-headed households (WHH) in preparation for this proposal showed that male out-migration affected more than 50% of households, creating new classes of *de facto* WHH in the region and diversifying household livelihoods to include remittances. Gender will be the focus of continual analysis during the project, in order to detect differences in gender needs for technologies and services, and enable these to be addressed promptly.

### Institutional and policy impact

Innovation in local institutions and institutional arrangements may well be just as important as, or even more important than, technological innovation in achieving change in farming systems. From the outset the SRFSI project will explore the effects of local institutional arrangements on farmer decisions, disaggregated by gender, including factors such as access to water, inputs and markets, and the social norms and arrangements that influence farmer decision processes. Through the local innovation platforms developed in each of the districts, institutional innovations that assist with the assessment, adaptation, scaling-out and scaling-up of technologies will be explored and developed. Project partners will initially play a major role in catalysing the formation and functioning of the innovation systems in the districts, but will over time withdraw from this role in order to provide a space for improved local ownership of the innovation platforms. The local innovation platforms developed through the project will facilitate the formation of new linkages and priorities among partners that will facilitate innovation and reduce barriers to adoption, and are expected to provide an arena for Interactions between different stakeholders which permit each to bring their comparative advantages and opportunities to bear on the problem of sub-optimal farming system productivity in the target areas.

The identification and implementation of strategies to build social capital in farmer groups, and the construction of farmer institutions and networks will provide a powerful impact pathway for behavioural and technological change. Case study research in numerous jurisdictions has demonstrated that these farmer institutions themselves can provide the catalyst for the development of demand-driven innovation platforms.

The project will also invest in building the capacity, both in terms of knowledge and physical capital, of service providers and agro-dealers as a means to improve the institutional support to smallholder farmers in the eight districts.

Project impact on institutions will be evaluated through adoption studies supported through SRFSI. In this study, farmer adoption will be linked to factors and institutions providing support to the farmer, permitting an evaluation of the importance of service providers, agro-dealers, extension agents, credit provision etc. on farmer utilization of new technologies.

### 4.3.2 Economic impacts

The economic impact of technological options championed by the project through enhanced crop yield, cropping intensity, and cost savings will be relatively straightforward to monitor through cost and return and associated studies with the field performance of appropriate ‘counterfactuals’ also measured.

Adoption of agricultural technologies by smallholder farmers involves multiple decisions at the farm household level, including the applicability of the technology, the capital requirements and expected benefits, the availability of necessary inputs and services, and, importantly, the risks associated with change. For this reason, adoption patterns of even simple, single-component technologies are initially slow and then follow an exponential growth curve as farmer experience and social support grows. We have estimated the expected economic benefits from the principal technological options likely to be prioritized by the project (DSR rice, CA for winter crops, supplementary irrigation of the winter crop, timely establishment of winter crops, increased cropping intensity in the winter permitted by timely sowing and supplementary irrigation, improved nutrient management in both the summer and winter, and overall improved agronomic management[[16]](#footnote-17)), together with estimates of adoption rates of these technologies by farmers managing demonstration plots and by farmers attending field days. We have also assumed a rate of secondary adoption – the rate of spread of technologies spontaneously among farmers. This is difficult to predict and varies widely between different technologies and regions, and is not constant over time. However, the rate of spontaneous adoption of laser levelling in NW India averaged approximately 250% (2.5 times more farmers each year) over the initial 10-year period, and the rate of growth of zero tillage in the same region over the period of 1996-2006 was, on average, over 300%, although early growth was more rapid and declined over time (Harrington and Hobbs, 2009). We have assumed an initial rate of 210%, declining annually by 10% over the 10 years after the start of the project. We have also assumed that only the farmers adopting the most widely incorporated technology (timely seeding of the winter crop aided by CA and irrigation) also adopt other technologies. Should this assumption be incorrect, the result will be greater numbers of farmers adopting technologies, but with somewhat lower benefits per farm.

Given that initial adoption levels are slow, especially of complex technologies involving changes in multiple technical components, we calculate that by the end of the project (mid 2018) at least 7,000 farmers will have adopted at least one promoted technology, with many of these farmers adopting multiple technologies. Annual benefits to farmers will be over AUD 2.5 million, and cumulative benefits to farmers during the project over AUD 4.5 million. By ten years after the beginning the project, however, we anticipate that 130,000 farmers (of whom at least 50,000 will be women farmers) will have adopted at least one technology that enhances farm profitability and sustainability, with an average increase in annual farm profits of approximately AUD 1000/ha (See Appendix F where detailed assumptions and modelling from Peter Brown – CSIRO, 2017 is presented), an increase in annual grain production in the EGP of 150,000 tons per year and total cumulative benefits to farmers from the project of over AUD 65 Million. With additional funding approved for strengthening the out-scaling component of the project, further farmer field days, farmer exchange visits, capacity building and business development activities for service providers and agro-dealers, all supported by information in multiple media, will enable an increase in the rate of spread of the technologies, initially by greater numbers of farmers directly exposed, but then by a higher rate of spontaneous adoption (farmers adopting technologies based on their own observations and learning, not facilitated through the project), conservatively calculated as starting at 270% and declining by 10% annually (i.e. 260%, 250%, 240% etc.). With this investment 1.5 million farmers could adopt technologies within 10 years.

The pathways to benefit 1.5 million households by 2021 is outlined in Figure 6. This approach relies on reaching many famers early in the project through a range of pathways/ strategies and activities (shown in Figure 4 & 5). Through convergence with national and state programs, aligning actors along the (machinery) value chains, capacity building at multiple levels and other support multiplicative benefits will be found to catalyse communities to adopt CASI technologies. This curve will be updated in the first quarter of 2018.



*Figure 6. Model for scaling out to reach 1.5 million households by 2021 (derived from Roy Murray-Prior adoption curve, presented at SRFSI Annual Meeting, Darjeeling, September 2016).*

In addition, the likely greater impact will be through diversification of part of the farm (explored with farmers in Activity 2.2.1) into higher value enterprises (e.g., vegetables, poultry, honey, fodder etc.) as permitted by the higher productivity of staple grains and the release of labour and land to other income generating activities. Such higher value enterprises are potentially nutritionally sensitive as well as requiring less land, and so may be of particular interest and benefit to landless and women headed households.

By the end of the original project we calculate that there will be entrepreneurs providing irrigation and direct seeding/transplanting services in at least 50 communities in the EGP. By year ten that number will increase tenfold – 500 communities – with water saving technologies to over 40,000 hectares of smallholder crops. The income to service providers from sowing these areas by year ten will be over AUD 15 million, implying increased employment opportunities in the region.

### Social impacts

It is expected that there will be multiple social impacts of the project, not all of which can be predicted in advance due to the complex and rapidly changing social structure of the region. It is intended that increasing employment opportunities within or near the community resulting from the increased business opportunities for service providers and agro-dealers will benefit not only farmers who rely on partial off-farm employment, but also for the many landless poor and sharecroppers in the region. In the longer-term, increasing the number and profitability of service providers in the region has scope to create better-paid jobs that offer an alternative to forced migration. Currently, migration outflows are rapidly changing the social fabric and family structures in the region and diversifying household livelihood portfolios beyond the farm. An alternative scenario may be that migration continues but that more effective use of remittances for on-farm investment are stimulated by the opportunities presented by the project. It is also possible that a reduction of labour requirements for work involving considerable drudgery such as for tillage, puddling and especially rice transplanting, will free up labour for other higher benefit activities such as value addition and schooling for children. In the longer term, possible changes in the pattern of land ownership, farm consolidation and different communal arrangements may result in improved economies of scale, but will require continued adaptation and modification of CA component technologies to address the changing farmer circumstances.

A switch to conservation agriculture including DSR will imply a reduction in tillage and transplanting time, thereby saving time for some women in farming families but reducing potential employment for other women from marginal farming or landless families. The intent is that such negative effects on employment opportunities will be offset by household investments in new enterprises enabled by freeing up labour from the heavy tasks of tillage and transplanting, and by the intensification opportunities offered by timely seeding of the winter crop and efficient supplementary irrigation.

The shocks associated with production and food price fluctuations can have a debilitating social impact on smallholder farming communities. However, the development of technologies that impart even partial resilience to these shocks will help to stabilize communities and potentially reduce disruptive coping mechanisms such as forced migration, or better harness the benefits of migration (e.g. remittances, new skills, knowledge and networks, and increased economic autonomy for women farmers heading households).

The project will prioritise the development and sharing of knowledge in farming communities rather than simply developing technological recipes. By facilitating an understanding of ‘why’ rather than simply ‘what’, the project will help farmers to better understand the risks and opportunities afforded by technological advances and permit better decisions on how to address these changes (i.e. increased adaptive capacity).

The SRFSI project recognises the important role of women in driving and leading practice change and focused on removing barriers to the participation of women in activities. This work will continue with a particular attention devoted to encouraging women entrepreneurs, supporting capacities of women’s groups to continue to provide vital services and mainstreaming (rather than researching) gender. An important research questions is; how can partners better understand the unique circumstance of women and other marginalized groups and embed these insights into program design?). In addition, the extension will present bottlenecks to the involvement of women at high level regional fora in an effort to influence policy making. Examples of areas where policy change could assist with the empowerment of women in agriculture include land ownership reform and credit access policy.

### 4.3.4 Environmental impacts

Conservation agriculture-based management typically is a net provider of ecosystems services, with a much lower environmental footprint than conventional practices. At the field level with CA, soil organic matter is accumulated and soil structure improved over time. Together these two factors provide better water infiltration and therefore less water run-off and erosion from sloping lands, greater retention of water in the soil, greater availability of plant nutrients, lower CO2 emissions, increased rooting depth and crop water extraction and better soil aeration leading to less nitrous oxide and methane production – two powerful greenhouse gases (GHGs). Leaving crop residues on the soil surface in CA systems provides a continuous food source for soil fauna and flora, increasing soil biological activity. Machinery use is markedly reduced by CA compared to conventional tillage systems – reductions in fuel use in the order of 70% are common. This again results in lower costs and lower GHG emissions.

One of the principal reasons for tillage is weed control, and a shift to CA generally involves more labour for weed control or, commonly, the use of more herbicides. In the winter the only extra herbicides likely to be used are desiccants such as glyphosate [[17]](#footnote-18) which has very low animal toxicity and little environmental impact given that it is tightly bound by soil particles and then broken down by soil microbes. However, weed control in rice under CA is problematic, especially if flooding is not possible once soil structure is regenerated. Herbicide options for weed control in rice are becoming more available, although they are generally expensive. However, although cost is usually more than offset by reduced labour costs, there are potential environmental impacts of increased herbicide use which will be quantitatively monitored.

Effective herbicide use is very knowledge intensive with specific products for different crops, and different weeds within those crops, as well as specific conditions and timing of applications, and, importantly, problems of toxicity. To reduce the possibilities for negative impacts, SRFSI will foster herbicide applications through well-instructed service providers, as well as enhancing the knowledge of agro-dealers who will help reduce negative impacts through warnings and improved advice on chemical use to farmers and service providers alike.

All irrigation development comes at cost. Nevertheless, this project prioritizes the most energy efficient options with respect to both pumping and in-field conveyance. It is likely that the GHG emissions (per ton of grain or equivalent) associated with these pathways for increasing irrigation availability will be more than off-set by increases in crop productivity and soil organic matter. Potential trade-offs will be an active area of inquiry for the project.

Over-use of groundwater is a major concern for the sustainability of the rice-wheat cropping system in the north-west Gangetic Plain, where water tables are falling dramatically and pumping costs are increasing as a result. The project team is well aware of the potential over-use of groundwater that can occur once it is seen to be a valuable resource in lifting farm productivity. In order to manage this risk IFPRI will study the impacts of policy on water use, including studies in north-west Bangladesh where policies have stimulated agricultural growth. The project will share data on water resources in the project districts with LWR2012/079, and benefit from the sub-regional water resource assessments developed by that project. Together the aim will be to develop safe operating guidelines that, if followed, will permit sustainable use of water resources in the EGP.

## 4.4 Communication and dissemination activities

The aim of this project is to enable widespread adoption of more productive, more sustainable and less risky technologies – quickly. This will necessarily depend on knowledge development among farmers. The principal communication and dissemination activities in the project will therefore focus on developing and facilitating information flow and the knowledge base among partners, including farmers, and potential partners to set the scene for rapid scaling out once funds are available.

Communication to end-users will be achieved through multiple channels, including farmers themselves as well as intermediaries such as service providers and agro-dealers who will both help support farmer-to-farmer information exchange as well as directly disseminate key messages as part of their businesses. Local extension and project staff will facilitate these processes by providing backstopping guidance as well as durable outreach materials for social marketing and educational purposes. The project will focus therefore on developing the knowledge base of all of these players to enhance their capacity to cooperate and coordinate efficient out-scaling technologies for sustainable and resilient farming systems.

Three specific and different modes of communication deserve special note:

1. **Community field days** held during the first year of the project will be facilitated by project development partners, but led by farmers and will cater to neighbouring farmers both in the spatial and socio-cultural (e.g. caste affiliation, gender etc.) senses. Field days in subsequent years will be more numerous under the associated out-scaling project.
2. CIMMYT will continue its work with IRRI and national research partners on developing **scalable decision tools** for ICT-based platforms. Nutrient management tools for rice, wheat, and maize are already in the pipeline for Bihar and NW Bangladesh; further development, particularly for incorporating climate-based information into decision processes, will be supported by this project. This component on the development of scalable decision tools is no longer central to SRFSI research strategy and will be discontinued in SRFSI (but will be carried forward under CSISA-III (Cereal System Initiatives for South Asia Phase III).  However, in due course selected decision tools resulting from the CSISA-III will be tested/disseminated through SRFSI.
3. Policy briefs will be prepared for policy advisors to sensitize them to sustainable water management issues. In addition, policy workshops will be organized for different stakeholders to promote sustainable water resources management options through higher allocation of resources and effective institutional arrangements. Sustainable water resource management road maps will be developed at the sub-regional level and SRFSI will support similar actions at the national levels.

# Operations

## 5.1 Methodology

Under variation 3, activities focus in 6 districts: Rangpur and Rajshahi in Bangladesh, Coochbehar and Malda in West Bengal, Purnea (Bihar) state of India and Sunsari of Nepal. Under the variation 3 the project activities will focus on 15 of the most promising nodes against the currently 40 nodes where the project operates. This means that investments in learning, capacity building and project financial support will concentrate there. However, since a range of stakeholders will be trained who are not confined to only those areas (national extension agents, banks, etc), scaling is expected to happen beyond the target area. Appendix G shows the list of nodes, the priority nodes and relevance to scaling for each node. In each community a field technician contracted by a project partner will oversee and support research and extension field activities in and around the community. In each district, the adaptive research will be conducted by research partners with the assistance of a Research Associate contracted by the research partner organization. Demonstration and out-scaling activities in each district will be led by development partner extension staff, in coordination with research partners and members of the local innovation system – all project partners will participate in the innovation systems and out-scaling activities. The following table shows which partners will have responsibility for the research and development activities in the eight project districts.

**Table 4 Selected district and initial research/ scaling partner and transitions**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| District | State | Country | Research | Extension Partner\* | | |
| Madhubani\*\* | Bihar | India | ICAR | JEEViKA (3) | Sakhi (2) |  |
| Purnea\*\* | Bihar | India | BAU | Agrevolution (4) | JEEViKA (1) |  |
| Cooch Behar | West-Bengal | India | UBKV | UBKV (3) | West Bengal DoA (2) |  |
| Malda | West Bengal | India | UBKV | UBKV (3) | West Bengal DoA (2) |  |
| Rajshahi |  | Bangladesh | BARI | BARI (2) | DAE (3) |  |
| Rangpur |  | Bangladesh | RDRS, BARI | RDRS (2) | DAE (2) and BARI (1) |  |
| Dhanusha\*\* |  | Nepal | NARC | DoA (5) |  |  |
| Sunsari |  | Nepal | NARC | DoA (5) |  |  |
| \*Number in parenthesis reflect the number of communities for which partner will have responsibilities  \*\* Lead over research activities to be taken over by CSISA/ NARS | | | | | | |

The project methodology follows a progression of interlinked steps with well-defined feedback mechanisms:

**Objective 1:** Understand farmer circumstances with respect to cropping systems, natural and economic resources base, livelihood strategies, and capacity to bear risk and undertake technological innovation.

* Rapid surveys and key informant interviews will be initiated in the early part of the 2013/2014 season in all eight districts to characterize household and communities, including disaggregation for women-headed households where relevant. The exercise will also describe current farming systems, presence of input, output and service markets, water resources and water use, farmer-defined limitations to system productivity and motivations for intensification, and local strategies to deal with climatic variability and shocks. The appraisals will identify representative communities for the establishment of on-farm trials and demonstrations, and further characterization studies will be undertaken in these communities.
* Flooding, surface water reserves and water table depth will be monitored by NARES staff in all project communities (8 districts x 5 communities = 40 communities) over the first two years using methodologies defined with IWMI staff to enable clear linkages with local water resource studies under LWR 2012/079. The IWMI social science team will take the lead in characterizing factors that govern access to irrigation along with bottlenecks and opportunities for area expansion.
* Farm typologies defined and operationalized with input from CSIRO and eventually incorporated into formalized decision frameworks.

**Objective 2:** Develop with farmers more productive and sustainable technologie**s** that are resilient to climate risks and profitable for smallholders.

* Field trials of new agronomic practices, such as CA, will be conducted in the fields of at least 10 farmers in each community (Total – at least 400 farms). Larger fields (>0.25 ha) will be prioritized to increase visibility and to avoid implementation and management problems that emerge when utilizing small plots with significant edge effects. Most trials will be replicated in 3 to 4 fields within each community and will be farmer-managed with backstopping from project staff and NARES partners. Monitoring and data acquisition will be coordinated by project partners and staff. In most cases, site differences within communities are not expected to be significant and this consideration will inform final site selections. Where possible, collaborating farmers will be selected by the community, and the project will work with existing farmer groups, especially groups of women farmers.
* Technologies will likely concentrate initially on best-bet options resulting from studies and experience in adjacent regions: CA systems, direct seeding and direct transplanting of rice, timely establishment of the winter crop, options for including a third crop after the main winter crop, supplementary irrigation for both summer rice and winter crops and site-specific nutrient management of all crops. However, the technology ‘menu’ will be guided by the initial surveys and participatory rural appraisals (PRA), and will evolve as farmer experience with different options matures – most of the potential technology options are not familiar to farmers in our target domains. The experience of participating farmers will be nurtured during the management of the on-farm trials and demonstration plots, with project staff continually providing information and helping understand the technologies and their effects.
* Throughout the technology evaluation process, continuous farmer consultations will guide the prioritization and adaptation requirements for different technological options to best match local conditions. Regular consultations with farmers (focus group discussions – FGD) will offer feedback that will inform the planning process. This participatory methodology will also be incorporated into the approach of NARES and development partners.
* Soil resources will be monitored for changes in organic matter (organic carbon and nitrogen), pH, available nutrients, soil porosity, water infiltration rates etc. at the initiation of trials and at the end of the project. Using simulations of the effects of project technologies on key soil parameters, especially soil organic matter, over extended time periods with both historical and possible future weather data, the APSIM model will be used to evaluate the long-term sustainability of technological options on the soils of the region.
* Soil-Crop-Atmosphere models (e.g. APSIM) will be regionally validated using results from on-farm experiments; validated models will be used to explore the profitability, sustainability and risk reduction potential of technological options under different contemporary and future climate scenarios[[18]](#footnote-19). Using actual, historical and predicted sets of climate data, the model will be used to explore technology effects, sustainability and riskiness over longer time periods than possible for field results in a 4 year project. Layered approaches to technology adoption will also be evaluated. Four scientists from the region will develop expertise in the use of the APSIM model and will lead these studies, supported by CSIRO and the University of Queensland scientists.
* Work will continue to refine and improve ICT-based scalable decision tools for rice, wheat, and maize, and to incorporate weather forecasts into decision guides for farmers for more efficient management. Activities will include the compilation and formatting of relevant research findings, technical information, and climate-based information, and the programming, debugging and maintenance of decision tools and associated databases to ensure continuous operation of decision tools. Technical assistance will be provided to project scientists on interpretation and use of research findings. Decision tools will be upgraded continuously, incorporating new geo-referenced data as well as new developments in ICT and spatial information management. (As above – 2nd bullet under 4.4 section).
* CA implements for both 2- and 4-wheel tractors (depending on local availability) will undergo evaluation with the participation of machinery manufacturers, service providers and farmers in each district.
* Efficient pump technologies and water conveyance options (including laser land levelling) will be quantitatively evaluated with NARES research partners from the perspectives of technology targeting (e.g. AFP technology can save 40- 60% energy per unit irrigation water, but only in situations where lift is less than 3 meters). Field assessments will characterize realized efficiencies under a range of on-farm conditions – including field size and different power sources. The niche for, and economics of, solar pumps for staple crop irrigation will be given high priority.

**Objective 3:** Catalyse, support and evaluate i**nstitutional and policy changes** that establish an enabling environment for the adoption of high-impact technologies from Objective 2.

* Throughout the project targeted surveys, stakeholder consultations and FGDs, will be conducted to explore the technology preferences and decision-making processes of both men and women farmers and guide technology development activities along with companion interventions (e.g. training, access to credit and markets) that may foster innovation. The impact of commodity prices, wage rates, labour availability, input costs etc. will be analysed using sensitivity and cost/benefit analyses, and the effects of different scenarios on farmer decisions explored.
* Decision support tools will be used to prioritise high-impact technologies. Evaluations of efficiency, equity (including gender equity), sustainability and GHG emission balances will be used to prioritise the technology options developed under Objective 2. The environmental costs and trade-offs associated with different development pathways will be evaluated with a carbon accounting framework such as the Cool Farm Tool (<http://www.coolfarmtool.org>).
* Contingent evaluation techniques will be employed to assess farmers’ preferences and their willingness to pay for technically feasible high-impact technologies.
* Constraints to adoption of promising technologies and their conditions of success will be analysed by developing the socio-economic and agro-ecological typology of the potential target domains.
* Farmer awareness programs will be organized and mechanisms developed to link farmers with financial institutions and remunerative markets.
* The core vehicle for overcoming limitations in the principal value chains will be the development of local innovation systems incorporating key value chain agents of the eight districts.
* The project will explore different options for increasing the availability and accessibility of CA and irrigation equipment in the project areas, including aspects of local production and availability of adapted equipment and credit for equipment purchase.
* Service providers (SP) will likely be a key to the adoption of CA and supplementary irrigation given the need for purchase of equipment. Support to service providers, will be provided both in the form of technical training and business development services, and different service provider business models evaluated for both efficiency and gender sensitivity.
* Backward integration for effective input delivery services will be strengthened by harnessing the provisions of on-going government programs (such as National Food Security Mission, National Mission on Micro Irrigation, and RKVY). Linkages with key service providers of key components of high-impact technologies will be established, and mechanisms will be evolved for effective delivery system.
* Existing policies, programs and institutions will be evaluated for up-scaling the high-impact technologies that promote climate change adaptation and minimize externalities including GHG emissions. Alternatively, new institutional frameworks in the existing policy environment will be evolved for larger impact. Multi-objective programming will be used to maximize the income and minimize GHG emissions.
* The impact of promising technologies will be quantified in an ex-ante framework and shared with policy makers.

**Objective 4.** Facilitate widespread adoption of sustainable, resilient and more profitable farming systems.

* The project will initially establish field activities around 5 communities in each of the eight districts across the EGP of India, Nepal and Bangladesh. Each community will host technology evaluations, including CA technologies and efficient water access and use. These sites will also serve as training and learning centres.
* The provision of essential machinery will first be facilitated by the project in collaboration (where feasible) with the State Departments of Agriculture. A market development approach will be used to help machinery manufacturers and distributors move into new markets in the target region.
* Short training courses using farmer field sites as learning platforms will be a key activity throughout the project. At the start of the project, all partners who will be involved in the management of project field activities will participate in a course on farmer participatory research, innovation platforms, gender sensitivity, conservation agriculture, supplementary irrigation and facilitation of farmer-to farmer exchange.
* In conjunction with the proposed out-scaling project, regular courses will be offered for service providers and agro-dealers, helping form a network of project alumni that will be used as the basis for further information and knowledge dissemination. Courses will focus on project technologies, business development, and the role of farmer-to-farmer knowledge exchange for building demand.
* The project will initiate opportunities for farmer knowledge sharing. At least 40 field days in both the summer of 2014 and the 2014/15 winter will allow more than 8000 farmers from the areas surrounding the project communities to be exposed to the ‘new’ technologies and to have them explained in their own language by farmers themselves. Numerous further field days will be carried out under the associated out-scaling project.
* The adoption of CASI innovations by 2021 is the principal indicator of success of the SRFSI project. The advantage of ex-post adoption studies is, firstly, that there is no bias because project implementers are no longer involved. Secondly, whatever incentives the project has provided (equipment, inputs, etc.) are not influencing the adoption of farmers anymore (Andersson and Giller, 2012). The design and implementation of that ex-post adoption study is beyond the scope of this project, and will be commissioned by ACIAR directly.
* However, it is important to keep monitoring the adoption during the project lifetime. It is therefore proposed to do an adoption study around the end of 2018, in the Rabi season when use of CASI innovations should be at its peak. It can be designed and implemented by CIMMYT or by one of the partners, in a cost-efficient manner. Stakeholders involved in the project (direct) and stakeholders who were never targeted by the project (indirect) will be included. Especially the latter group is important from a scaling perspective. Direct beneficiaries will be categorized in three groups according to their level of involvement, see bullet below. Focus group discussions with female/male farmers who were (or not) part of an innovation platform will be held in random sample villages (field visits). Other actors along the value chain will be reached through the innovation platforms (Focus Group Discussion) or on an individual basis (random). Decision makers will be asked about their awareness and level of promotion of CASI. The project partners will be asked to fill a questionnaire to probe the institutional adoption (and dis-adoption) of the promotion of CASI in their organisation and the potential to continue promoting CASI without project support. The guiding questions will go beyond on-farm adoption, trying to capture key elements of an enabling environment for scaling of CASI adoption.
* The adoption process normally constitutes five levels, triggering 3 mental states, as can be seen in the Figure 7 below. The project currently addresses the needs at that level with a range of activities (green blocks). We distinguish two intermediary steps (REACH and TEST) before ADOPTION takes place. The adoption study has to deal with these three levels separately, which are the knowledge and understanding of CASI, exposure to test CASI and eventually adoption of CASI innovations on a particular part of the farm, over a particular time.



*Figure 7: Adoption process, project activities and focus of the adoption study*

* Much depends on the definition of CASI in the context of SRFSI as provided in Box 1 Section 2. Furthermore CIMMYT (Andersson and D’Souza, 2014) found from adoption studies on Conservation Agriculture four basic dimensions of adoption:
  + the number of farmers taking up;
  + the technologies or practices they take on;
  + the land areas to which these practices are applied, and;
  + the number of cropping seasons in which these are applied.

These four dimensions could be applied to all three levels of the adoption study (reached, tested and adopted), for example, “how many farmers were actually trained”. Much of the data is available from the existing M&E system (e.g. Table 5). Adaptation of the promoted CASI innovation is an important level of acceptance of the technology and falls under the second dimension “technologies or practice they take on”. Building on the available farming system characterizations (Appendix E section 10) and household survey results will give insight in farmer resource-allocation strategies, and farm-level adoption constraints different types of farmers face.

* However, especially considering the attention of variation 3 on the enabling environment for scaling any adoption study in SRFSI one cannot focus only on the technology and plot level, but needs to integrate higher-level contextual factors and prerequisite conditions for adoption as well. This system perspective requires the use of different type of studies focusing on the wider market, institutional and policy context are needed. Moreover, not only farmers, but policy/decision makers and other actors along the value chain are targeted, which need to be included in the adoption study. Data will be collected towards the following scaling indicators:
  + Number of service providers available to support adoption of CASI by farmers (inputs, machinery, capacity building, etc)
  + Amount of investments of the private sector in CASI technologies and supporting infrastructure
  + Changes at strategy, policy and regulatory level that show acknowledgement of CASI as an important solution to be promoted with public resources.
* At the start of 2018, the current M&E system will be reviewed and better aligned with the principles drawn out here for the adoption study
* The activities supported under the Variation 3 are integrated in Objective 4. The eight steps to come to strengthen capacities for scaling are given below. They are integrated under the different sub-objectives shown in the Activities and Milestones logframe in Section 5.2.

**Variation 3: Strengthen capacities for scaling of CASI innovations**

This variation to the SFRSI proposal focuses on one core aspect of scaling - that is**- scaling through capacity development** as well as **monitoring and learning from the scaling and adoption process**. After 3 years of implementing SFRSI phase 1 it was found that there is a large need to enhance capacities of actors in order to achieve the project targets. Strategic partners (such as the BGREI and Prime Ministers Modernisation Program) need to enhance their capacities to accelerate awareness raising on CASI, improve proper application of CASI and to enable sustainable and responsible scaling of CASI innovations, for example. The project will actively approach state and national governments to influence their decision making around improving rural livelihoods. Capacity Development (CD) is a crucial and strategic enabler in the complex process of achieving development outcomes through research. As responsibilities for scaling are passed on to local partners, there will be a need to develop their management, resource mobilization and partnership building skills.

The following steps are important to develop and implement a capacity development strategy.

**Step1: Inventory of capacity development initiatives**. First, the existing and ongoing capacity development efforts of the SRFSI project will be evaluated. Table 5 shows an overview of the different types of CD activities, the number of beneficiaries, kind of events organized up to April 2017 (Annual report May 2016-April 2017). The relevance and effectiveness of existing CD materials will be evaluated. This also includes the use CD materials from other sources, such as the CSISA and SIMLESA (both CIMMYT) but also other (Australian funded) programmes (KATALYST[[19]](#footnote-20), Market Development Facility, etc). Second, an overview will be made of existing CD programs and materials that focus on sustainable intensification and the same geographical areas in India, Nepal and Bangladesh. These can be from NGOs, government organizations, private sector and grass-root initiatives.

**Table 5: CD measures implemented so far by SRFSI**

|  |  |  |
| --- | --- | --- |
| **CD measure** | **Nr of beneficiaries up to 04/2017** | **Outputs** |
| Awareness (media) | Unknown (indirect) | print media (140 times); radio/tv/web (70); posters (30) |
| Exposure visits (demonstration, open days, exchange visits) | +/-18,000 (+/- 43% female\*) |  |
| Participatory learning events (e.g. farmer consultation/planning meetings, innovation platform) | About 7000 (+/-40% female) | 1271 on-farm participatory trials set-up |
| Trainings for farmers | 6445  (+/- 30% female) | Training materials on:   * CA, * Crop management, * laser levelling, * value chain and market development, * Entrepreneurial skills dev. * Seed systems * other |
| Trainings for local service providers | 661 (incl. 18 community business facilitators trained)  (+/- 5% female) | Training materials on:   * Business development services, * CA machinery and maintenance, * Efficient irrigation and crop management services * other |
| Trainings for IPs | 2641 (40 IPs) (34% female) | * Learning modules |
| Training for scientists and project staff | 600 | * including 30 “CA champions” received an international training) |
| \*From the document: Participation of Men and Women in SRFSI project activities May 2016-April 2017 | | |

**Step 2: Scaling assessment**

CIMMYT and PPPlab[[20]](#footnote-21), in conjunction with a to-be-defined local partner, will use the scaling tool described in Section 2.2.2 to do a rapid assessment of the scalability of CASI technologies in a selected country. This allows integration of scaling principles in Theories of Change (Theories of Scale) and impact pathways, and it allows to map and prioritize interventions. This will be used as a vehicle to build capacity on, and learn from, the multiple scaling processes initiated in the project. Project partners will be involved in the application, fine-tuning and capacity building around the tool. This is planned for January 2018.

**Step 3: Needs assessment**

The identification of capacity needs across all levels and networks is the critical pre-requisite for designing capacity development strategies and interventions (CGIAR, 2015). Needs assessments should determine the gap between required and existing competencies at different levels to deliver expected outputs, achieve outcomes and contribute toward broader development goals. In addition, this may include an assessment of gaps in staff, infrastructure and equipment required for effective research all the way through to delivery. The needs assessment also builds on the rapid assessment of bottlenecks to scaling of CASI innovations and associated capacity gaps that should be filled. These assessments will help to attract and target appropriate investments, develop partnerships, leverage other resources available for capacity development and provide benchmarks for future monitoring, evaluation and impact assessment. It is important to note that SRFSI developed the capacity of > 20 national partners through advanced courses in country and abroad in CASI and these resource persons can be called upon.

**Step 4: Plan and support training campaign for the 2017/2018 Rabi season**

Scale capacity enhancement efforts for **Rabi season** 2017/18 through **ToT** of 3-level cascade system (Capacity Needs Assessment, M&E&L). The potential for innovation, and higher profitability, is highest in the Rabi season (Oct-Mar) as farmers are willing to deviate from known crops and practices. In contrast, farmers tend to stick to rice in the Khariff season. A training campaign will be implemented the coming months, to boost adoption of CASI among farmers and other stakeholders. This training campaign needs to be prepared based on the existing materials available. The capacity building activities will be closely monitored. The training occurs at three levels in a training-of-trainer cascade systems:

* Level 1: This is primarily a planning meeting engaging the Level 1 trainers who will: Plan the ‘train the trainer workshops, Agree on the key technical and management issues to be presented and develop and agree on the ‘session plan’ for the training
* Level 2: Level 1 trainers deliver to Level 2 trainers the ‘train the trainer’ program that aims to provide the Level 2 trainers the necessary skills and information to conduct Level 3 training to the farming groups at the node level. Target: 4 regions x 20 gives 80 “Level 2” trainers trained
* Level 3: Node/community level- training of farmers and communities. late October/November. Target: each “Level 2” trainer trains 10 people, gives 800 people trained at Level 3

The capacity needs assessment exposes the knowledge gap of farmers and service providers before the Rabi season. These will be validated and monitored during the implementation of the trainings. In addition, recommendations should be formulated and implemented about the individual and organisational capacity of project partners to facilitate capacity development efforts for scaling in the future.

*-------------------------------------------------------------------------------------------------------------------*

*It is proposed that a Consultant be hired under the existing SFRSI contract to plan and support with the training of trainers to prepare farmers for the 2017/18 rabi season, as well as to implement steps 1 and 3 (Inventory and Capacity Needs Assessment).*

*-------------------------------------------------------------------------------------------------------------------*

**Step 5: Development of CD strategy and implementation plan in collaboration with partners**.

The lessons learned from the implementation of the 2017 Rabi training campaign and the Capacity Needs Assessment will inform the development and implementation of a Capacity Development Strategy (CDS). Thereby we are guided by the following;

* 1. Capacity Development efforts in the Variation 3 of SFRSI revolve around a more conducive enabling environment for the adoption of CASI innovations. Hence, the focus of CD measures go beyond plot and technology level to include issues that define the enabling environment for technology adoption (e.g. business cases, ICT, awareness, value chain development, financing, knowledge, governance, partnerships and coordination)
  2. Build on existing capacities and CD initiatives and see how they can be aligned to serve the purpose of SRFSI. This will be informed by the inventory of step 1.
  3. Needs based: It is important to cater for the needs of a large variety of interdependent stakeholders that are relevant to SRFSI. Each of these stakeholders would have different needs with regards to training, engagement and careers in effective local development. This will be informed by the needs assessment of step 2. The scaling and capacity needs assessment will also inform the roles and responsibilities that the different partners should take up.
  4. Ensure a fit between individual, organizational and institutional CD. For example, there is no point in training people in use of equipment if they don’t have access to the equipment at home, or in their organization, to practice.
  5. Commitment: In order for CD to be effective, all stakeholders must be open and committed to contributing, implementing, learning and growing. Therefore it is important to understand the different business models of the stakeholders involved and to realize that any intervention that requires time and other resources should create added value for them within, but also, beyond the project. SRFSI aims to trigger this commitment by working needs based, co-learning and leveraging co-funding for activities.
  6. Work with the right partners from the formal as well as the informal sector using key quality criteria for their identification.
  7. Equity: target at least 35% participation of women in the CD measures
  8. Sustainability: Embed CD materials with partners, especially partners that can incorporate the materials in a larger formal curriculum. When they award officially recognized certificates this can advance the careers of the participants. Opportunities for synergies with Agricultural Technical Vocational Education and Training (ATVET) (formal and informal), formal education[[21]](#footnote-22) and academic institutes should be sought. In addition, it is essential to involve and train a critical mass of local trainers to ensure continuity in delivery of trainings at specific times and locations.
  9. Design the CD materials such that they can be easily replicated, adapted and multiplied. This also applies to a cost-effective method for implementation of CD measures.

Given the short time left in the project it is unlikely that all the scaling ingredients can be optimized for each of the challenges. In order to get a good understanding of the influence of each ingredient on scaling CASI innovations it is proposed to focus resources (financial and human/consulting) on learning around priority scaling ingredients per region. Those priorities should become clear from doing a scaling assessment (Step 2), but the following Table 6 gives already an indication how that may look like.

Table 6: Summary of challenges and opportunities per region and proposed prioritization of capacity development for scaling

|  |  |  |  |
| --- | --- | --- | --- |
| **Region (partners)** | **Challenges** | **Opportunities** | **Priority Variation 3** |
| Bangladesh (RDRS, BARI,  DAE, Conservation Agriculture Service Providers Association CASPA) | * Poor access to affordable and quality machines for ZT/ST tillage, threshing and post-harvest * Rajshahi: poor demand for machines | * Synergies with CIMMYT/iDE CSISA MI project on machinery value chain * Good quality data available to build credible case for CASI * RDRS and its network can reach +/- 4 million people * About 110 Versatile Multicrop Planters (VMP) operated by Local Service Providers (LSP) in 2017, united in CASPA * BMDA and its network can facilitate for crop diversification and mechanization through guided control on deep tube well irrigation network | * Learn around scaling in NGO-led context * Machinery Value Chains * Knowledge exchange with CSISA * Building awareness and knowledge of CASI in RDRS extension staff and RDRS partners staff * Training the VMP Local Service Providers in business skills * Expand farmers demand for services around LSP by awareness and capacity building programs |
| India- Bihar  (BAU, AgRevolution, Jeevika, ICAR, Sakhi) | * Capacities around PPP * Scaling beyond SRFSI project * Soil fertility and crop nutrient management in high potential maize areas. | * Good experience working with NABARD and with partners intervening at market level/micro-entrepreneurs (DeHaat), community mobilization (Jeevika) * Machines are available | * Learn around scaling in private sector-led context * Data and ICT (e.g. for market aggregation and price knowledge) * Access to finance * Business models around links with big private sector players |
| India- West Bengal  (UBKV, DoA WB) | * Capacities to strengthen value chains | * Experience with a backstopping role to support scaling. * Submitted a proposal to the state government to support scaling of CASI * Good institutionalization of aligning research and extension (steering committee, clear roles and responsibilities). * Dynamic business environment * Machines are available | * Learn around scaling in Public sector-led context * Integration of scaling thinking into state programming * M&E around UBKV/DoA showing leadership in scaling in the state |
| Nepal  (NARC, DoA) | * Weak partnerships within and beyond districts * Poor access to machines * Weak capacities beyond research. | * Large demand from farmers for zero-tillage, but poor support * Prime Minister Agricultural Mechanization Program (PM AMP) * Good experience working with self-help groups to explore the potential for mechanization | * Public sector governance (to influence PM AMP), * the effect on the scalability of CASI through better partnerships |

**Step 6: Development of CD materials**. CD materials usually consist of a trainer guideline, trainee manual, hand-outs (incl evaluation sheets) and specific materials or set ups (demonstration, computers, etc.) required to perform the training. The materials should have a recognizable and clear overall structure with learning objectives, targets and requirements clearly defined. The principles of adult learning will be applied and trainers should have acquired excellent didactical and moderation skills. Currently, training materials have been developed and applied on conservation agriculture, crop management, laser land leveling, weed management (CSISA), Zero Tillage (CSISA), value chain and market development, entrepreneurial skill development, Business development services, CA machinery and maintenance, efficient irrigation and crop management services. The following topics are relevant for scaling:

* + Crop diversification (individual level)
  + Business Model training (individual and organization level)
  + FEW nexus for decision makers (e.g. to develop Nexus case studies) (institutional level, but to be covered by SDIP 2 project)
  + Strategic partnerships (organizational and institutional level)
  + Programming, Theories of change and impact pathways (institutional level)
  + Financial services – demand/supply
  + Identification and strengthening of multi-stakeholder platforms to operate as an innovation platform (organizational and institutional level)
  + Farmer organization and institutionalization (organizational and institutional level)
  + Farmer market intelligence and networking to support diversification and intensification of agriculture production aimed at responding to market demand, for example by linking to private buyers (ITC, Reliance, Spar, etc. and promote buy-back arrangements where the same company is involved in inputs and produce aggregation (e.g. TATA/ Mahindra/ Syngenta)..)
  + Proposal writing and funds acquisition for local scientists and others (organizational level)
  + other

The project team and partners will have to prioritize the most relevant training topics because there are probably only resources and time to develop 2-4 new modules. The development of the training materials will be sub-contracted (as well as the organization of training events).

**Step 7: Quality control Trainers.** SRFSI relies on a large number of partners to actually implement the trainings[[22]](#footnote-23). It is therefore important to have proper quality control mechanisms in place for the trainings. First of all, the national partners with a mandate for capacity building should make available trainers for the SRFSI capacity development program. This should be part of an overall agreement between SRFSI and the partner. Then the pool of trainers will be evaluated on, and potentially trained in, adult learning methods and andragogy before going in-depth in the different technical topics. The Monitoring and Learning expert hired under the Variation 3 coaches the trainers and evaluates their performance.

**Step 8: Implement trainings**. Until the Monitoring and Learning expert caught up with steps 1-5, the trainings already planned under SRFSI-1 will take place. The existing process for implementing trainings will be reviewed and adapted accordingly. The innovation platforms offer good opportunities to develop capacity around problems identified by stakeholders.

**Step 9: M&E&Learning**; the CD measures are aimed to improve the capacity of stakeholders to create an enabling environment for large scale adoption of the CASI innovations. This requires capacities to navigate complexities, to collaborate, to engage in strategic and political processes and to reflect and learn (TAP, 2016). Specific indicators for adoption (1) and scaling (2-4) will be used to monitor progress in these areas, for example:

1. Number of farm households and other actors along the value chain, reached/tested/adopted which kind of CASI innovations to what extent (area and number of seasons) through the adoption study
2. Number of service providers available to support adoption of CASI by farmers (inputs, machinery, capacity building, etc)
3. Amount of investments of the private sector in CASI technologies and supporting infrastructure
4. Changes at strategy, policy and regulatory level that show acknowledgement of CASI as an important solution to be promoted with public resources.

Currently it can be stated that there are 3 clearly different scaling models going on in the SRFSI project, these are private-led (Bihar), NGO-led (Bangladesh) and Public Extension-led (West Bengal). The Scaling assessment from Step 2 will be done first on one of these models, and then potentially expand to cover the other models as well. The priorities of the activities under variation 3 build on the experience per region with their particular scaling model, and hence, the monitoring and learning around that (Table 6). The lessons learned will feedback to step 3- needs assessment and the consecutive further steps. The M&E&L expert will ensure that results from M&E are fed back to the people where the data come from (farmers, partners, etc) as part of the communication strategy.

**Data Management**

The IARCs have developed extensive networks of trial sites where improved varieties and technologies have been evaluated. However, NARS and the IARCs typically manage information about the sites and the performance of agricultural technologies *ad hoc*, with little of this information being widely accessible, shared or repurposed. In an effort to make datasets of agricultural trials publicly and widely available, an agricultural data repository, AgTrials (<http://agtrials.org>), has been developed by CIAT and the CCAFS CRP, in collaboration with IARCs and NARS. AgTrials standardizes agronomic trial information for the benefit of future climate change analyses, future multi-environment trials and research and development in international agriculture. CIMMYT has initiated a collaborative effort with CIAT to make substantial usability and metadata schema improvements to AgTrials using the CIMMYT-led, multi-CG CSISA project as a pilot project, which will be of value for SRFSI data. However, before data can be uploaded to a repository, it must be collected and documented appropriately. Data collection practices are inconsistent and often sub-optimal even within a single project such as CSISA, let alone across multiple projects within an institution or across institutions—resulting in an inability to easily harness the power of data from a multiplicity of domains. Some exciting work has been done in the CSISA project to enable systematic digital collection of “simple data” (such as documentation of events, service providers etc.) using the Open Data Kit (<http://opendatakit.org>), which can be easily leveraged for SRFSI. A new effort to create an online agronomy field book database, using the Integrated Breeding Platform (IBP) of the GCP, will initially be tested by CSISA and will also be of value in SRFSI. This work will allow: the gathering of consistent, well-documented data across projects, their temporary storage and statistical analysis within the IBP framework. Auto-upload functionality of data sets from the IBP into AgTrials is also proposed. The database will be accessible yet secure, with time-bound locks on data sets and different permission levels for data access.

**Project management and governance**

A Project Leader (PL) will oversee the SRFSI and variation 3 implementation in close consultation with Science Coordinator and a full-time Project Manager (PM) supporting project administration and M&E. The PL together with the Science Coordinator and four local project coordinators, one from each State (in the case of India) or country (Bangladesh, Nepal) will form the regional Project Coordinating Committee (PCC) which will hold regular meetings. A senior Monitoring and Learning Expert will be hired to oversee the implementation of the activities added for the third variation. International and national consultant expertise will also be sourced for the tasks described in Table 7. Potentially they could be employed in a tandem with a local expert for two-way learning. Within each country/state a coordination committee with representatives from all major collaborating institutions will be constituted. Frequent reviews of results and field work, coupled with ongoing conversations and consultations with farmers and other members of the principal value chains will allow adjustments and reorientation of the project where necessary. SRFSI will establish an internal learning function to not only support adaptive management but also to identify and document unexpected but important events and processes.

**Table 7: Consultants, main tasks and tentative timing under variation 3**

|  |  |
| --- | --- |
| **Consultant** | **Main task** |
| International |  |
| CIMMYT machinery value chain experts (CSISA)  30 days | Actively integrate lessons learned and the network of CSISA into SRFSI to improve machinery value chains  As of January 2018 |
| CIMMYT scaling expert  45 days | Scaling assessment, capacity building on scaling and strategic support and prioritization  As of January 2018 |
| Sector specialist Finance  30 days | Assessment of financial climate and opportunities and threats to scalability , rapid stakeholder assessment, capacity building (e.g. understanding of financial institutions on risks involved in CASI and potentials to increase lending in this space, ability of SMEs to develop business plans in order to qualify for finance, etc.), tentatively focus on Bihar  First quarter 2018 |
| Sector specialist Lobby and advocacy  30 days | Assessment of opportunities and threats to strengthened efforts on lobby and advocacy, rapid stakeholder assessment, capacity building on best practices, tentatively focus on West Bengal and Nepal  First quarter 2018 |
| Sector specialist Communication and awareness  30 days | Support the development of the communication strategy to be implemented by the national CIMMYT expert and provide guidance to partners to develop communication strategies geared towards scaling CASI  3rd quarter 2017 |
| Sector specialist Partnerships  30 days | Capacity enhancement on building and maintaining strategic partnerships (why, with whom, how to partner?), tentatively focus on West Bengal and Nepal  First quarter 2018 |
| M&E&L/ Adoption expert  35 days | Design adoption study, and integrate adoption and scaling indicators and data collection methods in existing M&E&L system. Support data collection and process documentation around different scaling models.  Budget from carry-over funds M&E&L variation 2  As of January 2018 |
| Local consultants |  |
| Sector specialist Fund management (local)  15 days | Support set up of Strategically Commissioned Grant Scheme, eligibility and selection criteria and management guidelines. Local expert  3rd quarter 2017 |
| Socio economist (local, S. Maharjan) | support socio economic studies and management of repository of training materials  up to end of project |

The Project Monitoring and Evaluation Framework (Annex 8.4 of the original SRFSI document) will be discussed, analysed, and adjusted as necessary by all project partners annually. At each bi-annual district planning and evaluation meeting, project advances will be analysed against the Project M&E Framework, problems identified and suggestions for modifications taken to Project Management for discussion and analysis at the next Project Planning Meeting, or before if urgent decisions are required. Any major requested change to the Project Log-Frame and M&E Framework will be discussed with the Project Steering Committee (see below); either at the Annual Steering Committee Meeting or in a virtual meeting if an urgent decision is required.

A Steering Committee (SC) will be charged with oversight of the SRFSI, as well as fostering harmonization with other ACIAR/DFAT farming system projects in the region in order to ensure adequate collaboration and efficiency. The SC members will include a high level person not engaged in SRFSI project implementation from each of the three project countries, a regional agribusiness and/or trade representative, and two representatives from ACIAR. The Project Leader will act as the Executive Secretary of the SC which will be chaired by one of the ACIAR representatives. The SC will meet annually and will have regular virtual meetings at the request of the members or the Project Leader. The participation of the representatives from the South Asia region will be funded from project funds, and ACIAR will support the participation of the ACIAR representatives. Other persons representing SRFSI partners or other major initiatives in the region (e.g. ACIAR LWR projects, CSISA, etc.) may be invited by the Committee to participate as non-voting members in SC meetings.

**Empowering implementation partners**

In the promotion of CASI innovation, SRFSI takes up three scaling roles (Wigboldus, et al., 2016); a controlled scaling process (making things go to scale), catalyse scaling processes (helping things go to scale) and create conditions for scaling (seeing things go to scale). Especially during the first years of the project the focus has been on making CASI innovations go to scale by delivering a proof of concept that works, is cost-effective, relevant and suitable to the target group. With the onset of the Variation 3 and an accelerated effort to build capacity to scale CASI innovations SRFSI empowers partners to lead the scaling efforts. CIMMYT sees its role to help create an enabling environment for change by raising capacity of partners to execute successful agriculture development support programs, and to develop market systems for new technologies. In a way, activities may be out of the “sphere of control” of the project team, and shift to a “sphere of influence” where we build capacities of partners to enable farmers and service providers make a conscious decision to adopt certain CASI innovations. This is an important and crucial step in any scaling process, after all, we want CASI innovations to be adopted far beyond the project lifetime.

For scaling to happen within and beyond the project lifetime, partners need to take up important functions, such as:

* Continuous assessment of needs of beneficiaries (Farmers, service providers) and the operating environment to allow adoption of CASI innovations
* Continuous assessment and development of the own organizational needs (resources, skills, knowledge, partnerships) to be able to deliver the required services
* Strengthening of quality and quantity of curricula on topics that are relevant to the beneficiaries in the short and in the long term
* Improve delivery mechanisms for effective capacity building to a range of target groups, such as local, state and national government institutes aiming to scale CASI

Table 8 below gives an overview of the partners and their key roles under variation 3.

Table 8: SRFSI partners and their roles

|  |  |  |
| --- | --- | --- |
|  | **Partner** | **Key role:** |
|  | CIMMYT | * Project leadership and management (reporting, etc) * Contract partner to ACIAR * Leadership in learning on scaling methods; hiring and coordination of required expertise to evaluate scaling methods * Individual and organizational capacity building of partners * Set up and manage repository of learning materials on CASI |
| Australian | CSIRO | * Plan, backstop and process documentation around potential for scaling of Innovation Platforms * Monitoring, evaluation and learning (M&E&L) innovation platforms * M&E&L 2017-18 rabi season * Conduct paper write-shop, data management and analysis including socio-economic data together with CIMMYT and Curtin University |
| Curtin University | * Continue gender component (e.g. gender productivity changes due to CASI, focus more on impacts than outcomes) * Support the integration of gender in the various national/state programs SRFSI will support * Contribute to the analysis of outcomes of the first year of variation 3 and draw lessons about scaling strategies * Develop a manual/ guideline for farm business economic analysis for smallholder farms together with CIMMYT SEP * Conduct training on SE data management training together with CSIRO and CIMMYT. |
| Queensland University | * No additional funding from Variation 3: research activities ramping down by June 2018 |
| International | IFPRI | * No additional direct funding from Variation 3. However, their expertise would be utilized for adoption study. |
| iDE | * CIMMYT and iDE have been partners for the implementation of CSISA MI in Bangladesh. iDE has relevant experience and capacity building skills in development of machinery value chains. Re-start collaboration on machinery value chains in Bangladesh. * Market studies around machinery and other priority value chains * Actively align incentives along those value chains * Provide recommendations on seed money to catalyse particular activities (buy machines/spare parts) * Capacity needs assessment and trainings * Identify obstacles to scaling of the value chain (from tax issues, to capacity, to access to finance, to awareness, etc.) |
| **National partners** | | |
| Bangladesh | BARC | * No additional funding from Variation 3 |
| BARI | * Engaged in ToT and farmer outreach program primarily in Rajshahi * Support agricultural machinery value chains * Knowledge exchange with CSISA and other projects * Institutional capacity building around scaling |
| DAE | * Support the integration of CASI in national scaling programs * Capacity building of farmers * Backstop learning around IPs and other multi-stakeholders forums |
| RDRS | * Lead partner for capacity building on scaling in Bangladesh. * Lead M&E&Learning around NGO-led scaling * Activate network to increase awareness on CASI * Training on CASI of agricultural staff not yet involved with SRFSI to integrate principles of CASI in other and future programs * Identification of actors along the machinery value chain and bring them together for capacity building, for example VMP local service providers * Knowledge exchange with CSISA and other projects * Backstop learning around IPs and other multi-stakeholders forums |
| Others | * Expand the Versatile Multicrop Planter (VMP) market in the most appropriate areas, building on existing network of Local Service Providers and their professional body CASPA |
| Nepal | NARC | * Lead partner for capacity building on scaling in Nepal * Support the integration of CASI in national scaling programs, notably the PM AMP * Support improvement of machinery value chains * M&E&L around adoption and scaling * Outreach programs |
| DoA Nepal | * Support the integration of CASI in the PM AMP * Backstop learning around IPs and other multi-stakeholders forums |
| Agrevolution | * Expand CASI technologies and practices using DeHaat model in Bihar and explore scaling DeHaat model in Nepal |
| Bihar | ICAR | * ToTs Rabi season 2017-18 (Level 1 training) * Production success stories including policy briefs * No additional funding from Variation 3. |
| BAU | * Lead partner for capacity building on scaling in Bihar * Support the integration of CASI in state scaling programs * Support scaling of promising service provider models such as DeHaat and Arayank * Organisation of platforms on access to finance and use of ICT for scaling CASI technologies * M&E&L around scaling, use of ICT and access to finance * Potentially take over responsibility for maintenance and dissemination of training materials in the repository * Backstop learning around IPs and other multi-stakeholders forums |
| Sakhi | * No additional funding from Variation 3 |
| JEEVIKA | * Community mobilization for awareness and demand creation for CASI technologies * Mobilise its own funding from World Bank |
| AgRevolution | * Developing business skills of aspiring micro-entrepreneurs and scaling the DeHaat model over this 2017-18 rabi season. * Leadership in business skills development (similar to the role of iDE in Bangladesh) * Encourage private sectors to invest on CASI innovations |
| West-Bengal | UBKV | * Leadership integration of scaling thinking into programming, notably the proposal on scaling CASI put forward to the West Bengal Department of Agriculture * M&E&L around UBKV/DoA showing leadership in scaling in the state (public extension-led scaling model) * Support improvement of the machinery value chain * Lead on capacity building efforts in the region * Collaborate with Agrevolution to improve business skills in West Bengal |
| DoA - WB | * Support the integration of CASI in state scaling programs * Capacity building * Strengthen multi-stake holders forum for CASI innovations |

**Strategically Commissioned Grant Scheme**

Funds will be reserved to enable partners take up those functions until the end of Variation 3. This will be done through direct grants, partnerships as well as through the adoption of a Strategically Commissioned Grant Scheme (SCGS). The scheme holds 160,000 AUD to fund eligible organizations and businesses who propose suitable plans to support an enabling environment for scaling of CASI technologies. Targeted are new organisations, private companies and NGOs, to become part of the project with creative and fresh ideas and approaches to scaling CASI innovations. These could be spare parts dealers, manufacturers of machines and a whole range of other organisations, for equipment, training or other support they might require. For example, CSISA is also largely successful in scaling mechanization technologies through investments in joint venture agreements (JVA) with the private sector. The JVAs support companies with access to technical and market intelligence, assistance with advertising and marketing campaigns, and of course access to farmer databases, and other awareness actions for dealers and distributers and mechanics (essential elements in the mechanisation value chain. Funds from the SCGS can be matched on a 1:1 or even larger private sector to project basis, but sets expectations of measured deliverables. In this example from CSISA not only capacity is transferred but also **responsibility** through targeted objectives on a calendar basis, to the private sector for sales and deployment of machines, etc. Another eligible organisation would be for example the “Conservation Agriculture Service Provider Association of Bangladesh” whose members operate the VMP and might require business skills development trainings. Those organisations file a request for funds, and when selected, get funding that should be managed by themselves, but accounted for towards CIMMYT, or lead partners per country. This modality of support builds on the good experience of CIMMYT/ACIAR with Intensiﬁcation of Maize-Legume Cropping Systems for Food Security in Eastern and Southern Africa (SIMLESA) in Eastern Africa where new partners, such as a TV station (Shamba Shape Up[[23]](#footnote-24)) received funds to make a TV-series on Conservation Agriculture. The SCGS allows us to work with partners that are at the moment not known to us, but who can support scaling on areas that are currently not receiving much attention (lobby, advocacy, awareness, finance).

Before the end of the year a Consultant will be hired to support set up of this Strategically Commissioned Grant Scheme, eligibility and selection criteria and management guidelines. The aim is that the design and structure of the scheme will be approved before the Steering Committee (SC) meeting of January 2018. Figure 8 below shows a proposed process for the initiation and implementation of the funds available for the SCGS, with responsibilities and time indications. A simplified version of this process could be initiated to select partners who will implement the trainings for the coming Rabi season. Involvement of key national partners in the set-up and follow up of the SCGS is crucial for potential institutionalisation of the process into national programs.

|  |  |
| --- | --- |
| **Planning and Strategy Development**  Formulation of goals, targets, objectives, list of feasible investments and indicators for SCGS, be it country specific | CIMMYT, Key national partners  Approved by SC  (month 1) |

|  |  |
| --- | --- |
| **Identification of eligible organisations**  Identify through own network, or potentially through public call, eligible organisations and ask for proposals with feasible investments and realistic budgets conform the guidelines. | CIMMYT, Key national partners  (month 2) |

|  |  |
| --- | --- |
| **Feedback, selection and contracting**  Proposed investments are revised and a final selection is made. A partnership agreement is set up indicating the co-investments and the partner is contracted.. | CIMMYT and implementing partners  (month 3-4) |

|  |  |
| --- | --- |
| **First Disbursement**  CIMMYT provides a pre-payment for services up to maximum 30% of the total contract value. | CIMMYT and implementing partners  (month 5) |

|  |  |
| --- | --- |
| **M&E and contract management**  CIMMYT monitors the quality of activities implemented by the partners and ensures wider learning. | CIMMYT and implementing partners  (as of month 6) |

|  |  |
| --- | --- |
| **Contract Termination**  Disbursement of funds  When no outlook for continuation, terminate the contract.  Explore opportunities for institutionalisation of knowledge and materials delivered, as well as potential embedding in national programs | CIMMYT, key national partners and implementing partners  (end of contract) |

*Figure 8: Proposed process for Strategically Commissioned Grant System (SCGS)*

**Coordination (M&E) and Learning**

The M&E and Learning Strategy for the project will include:

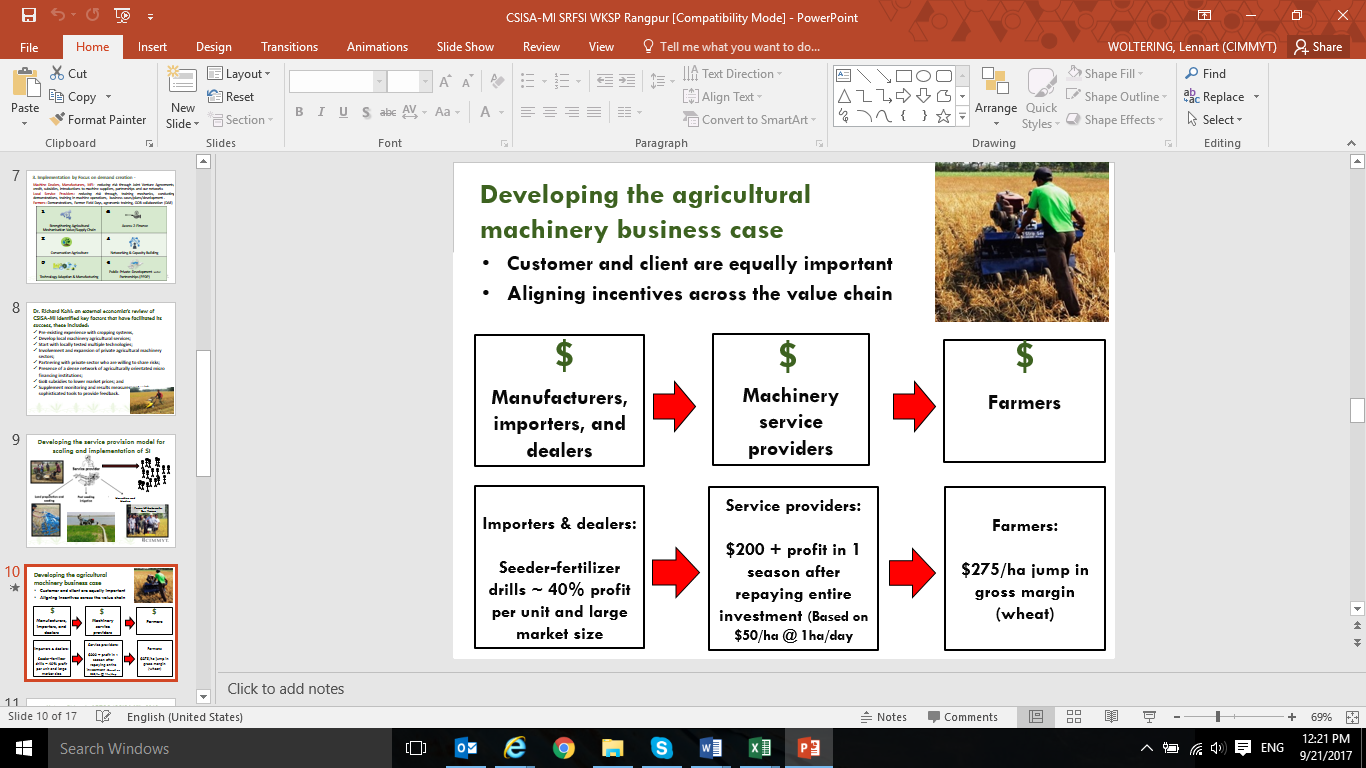
* The Inception Workshop and initial planning meeting which will be held in mid May 2014. All initial partner organizations will participate in the Inception Workshop, allowing for detailed discussions and definition of project activities and *modus operandi*. The Inception Workshop will also provide an opportunity to define researchers and geographical areas for more in-depth studies under CSIRO, Curtin University and the University of Queensland.
* Seasonal travelling workshops of field activities. These events allow all partners involved in each of the four national/state platforms to observe, discuss and learn from field activities and discussions with stakeholders, especially farmers. Observations and insights from the travelling workshops are carried through to the National Evaluation and Planning Meetings.
* Annual Review and Planning Meetings (AR&PM) will be held each year in Bangladesh, Nepal~~, Bihar~~ and West Bengal and finally at regional level to evaluate the information gained during the previous year, including results, observations, farmer commentaries and insights, and, based on the synthesis of these results, plan for the following year, which will be held in September. All partners directly involved in the project activities will participate in the relevant AR&PM.
* The Project Coordination Committee will hold bi-annual Project meetings (preferably in May and October) with key partners to discuss project advances, strengthen regional knowledge sharing, and define actions to increase project efficacy. If necessary adjustments to national/state work plans will be recommended to the local teams.
* Half yearly/annual reports. Based on the results generated from May – October and annual report covering from November to October will be drafted and will form the base for reporting to ACIAR.
* Annual meetings of the Steering Committee (SC) will be held. The SC will review project results and plans and make recommendations to ACIAR and the project on project organization, focus, adjustments and linkages.
* Adoption of CASI can be accounted to the project if practices are changed in line with the definition of CASI (see Box 1) as taught by the project. It will also be important to assess whether farmers and other actors along the value chain are aware of CASI as defined by the project, gained knowledge and skills in its application and promotion and show actual demand for CASI. In short, CASI should be known, available and bringing benefits to farmers and other actors along the value chain. Important indicators are:
  + Number of farm households adopting CASI innovations
  + Number of service providers available to support adoption of CASI by farmers (inputs, machinery, capacity building, etc)
  + Amount of investments of the private sector in CASI technologies and supporting infrastructure
  + Changes at strategy, policy and regulatory level that show acknowledgement of CASI as an important solution to be promoted with public resources.
* Monitoring adoption will involve surveys which will use electronic data capture as much as possible. Partners will be offered to use ComCare but we do not commit to impose ComCare if other tools are preferred.
* CIMMYT will hire a full-time M&E&L specialist to support the team measure the progress in terms of adoption of CASI.
* An interim final review of the Project will be conducted in February 2018. It will focus on the technical achievements of SRFSI since the inception, the strategies adopted for Variation 3 and early results and outcomes, and the lessons applicable to further research activities undertaken by ACIAR under SDIP2.
* A Final Review of the Project is planned during the final year (early 2019).

**Risk management**

The project will mitigate and manage risks from various sources, for example climate and market risk at farmer level, to institutional risk at district and State levels. The risk management matrix in the annex (Section 8.5 of the original SRFSI document) will be reviewed and updated annually.

**Private sector engagement**

Private sector engagement is critical for widespread adoption of CASI innovations. They play a key role along the value chain; buying and selling inputs and products, adding value and transporting goods. They also bring in new knowledge and networks that support the sustainable uptake of CASI innovations. During the first years of SRFSI it became clear that there are a range of profitable business cases to be made around the introduction and utilisation of CASI innovations. The CSISA project (CIMMYT/iDE with support from USAID) was able to show the profits for key stakeholders along the machinery value chain in Bangladesh (Figure 9). They found that, so far the private sector in Bangladesh has invested 1.68 Million US$ in the CA machineries that are being promoted by the project.



*Figure 9: Profits along the machinery value chain (source CSISA project)*

Murdoch University also gained a lot of experience with machinery value chains in Bangladesh, and they will be invited for knowledge exchange. Furthermore, Business for Development (B4D) with Green Agrevolution are establishing micro-entrepreneur centers in Purnea (Bihar) to out-scale access to machinery, inputs and knowledge to farmers (Agribusiness Model Pilot Design, report to ACIAR, 2017). Currently they are working in Bihar only, but SRFSI will support them to start activities in Nepal, and potentially West Bengal and Bangladesh. SRFSI will strengthen Farmer Clubs in West Bengal that are already performing well and get support from the government and the National Bank of India. The objective within SRFSI is not only that there is a “pull” from farmers for CASI innovations, but that the private sector generates a “pull” as well because they see a clear business case in its promotion. SRFSI supports this through exposure training to business skills development (see Box 3) for input and service providers and local micro-entrepreneurs, through involvement in multi-stakeholder forums (Innovation Platforms), engagement with CA machine manufacturers, and to explore options for “seed funding” and credit for CA equipment. In addition, the private sector is eligible to participate in the Strategically Commissioned Grant Scheme explained before.

One important focus within SRFSI variation 3 is the business skills trainings. The training is one of the key processes to build capacity within the farming community and supporting service industry. This training will be supported by Agrevolution in India and Nepal, and by iDE in Bangladesh, and further supported at the ground level by Community Business Coordinators. Agrevolution and iDE have course materials and technical skills for development of business skill training, and the local knowledge of how to run training courses to make them locally relevant. Agrevolution focus on the three pillars of availability, information and finance to get around the “missing middle” to catalyse private sector engagement and use the “Agricultural Business Engagement” model to demonstrate profitable approaches. Steps include engagement, development of business cases, involve community, align groups of farmers and demonstrate increases in yields and profits. A strong motivator is the “last mile delivery” of end-to-end service support. The course will cover topics such as business concepts, basic financial calculations, keeping records, understanding risk and competition amongst others. There will also be a strong focus on women as business partners, especially in supply chain reliability and accessing untapped employment talent. This targeted training will see the development of micro-entrepreneurs in each of the Districts. These micro-entrepreneurs will then be encouraged to pass on their learnings and experiences to others to further enhance the project impacts. Opportunities will be explored for the development of farmers as micro-entrepreneurs. For instance, some farmers that already own a tractor may find that new business opportunities emerge with business model training that could be used to provide CA machines to other farmers, or as a custom hire service. By providing this training and allowing the micro-entrepreneurs to seek new business opportunities will inevitably enable the increased use of CASI technologies across the farming community. This will provide the pull necessary to increase adoption of CASI technologies. During the first year, Micro-Entrepreneur Centres will be supported to provide end-to-end agriculture services. These will then be replicated to other Nodes in subsequent years, ultimately leading to a self-financing and replicating “franchise” model underpinned by a revolving loan facility.

We will also build on a business skills training program run by SRFSI on “Zero-tillage service provision as a business opportunity” which has successfully been developed within the CSISA project. The aim of the business skills training would be to create a supportive environment to allow micro-entrepreneurs to try business skills themselves, but to still receive some initial technical backstopping. A key success factor will be to enable participants to learn about concepts around maximising profit. It is expected that they will then pass on their skills to other and to build up networks of micro-entrepreneurs to address a range of business issues. This will help create a “pull” mechanism to encourage adoption of CASI technologies and practices.

Some initial Innovation Platform activities are underway at the node/community level where SRFSI partner Innovation Platform facilitators have already identified agri-businesses and gauging their interest in providing inputs to farmer groups and their capacity to do so. In addition, some Indian corporations have shown strong interest in supporting entrepreneurship and capacity at local level, and additional field activities are being funded. This process for engagement will be undertaken prior to the 2017/2018 Rabi season using existing farmer groups and networks to explore CASI innovations. It is during the Rabi dry season that SRFSI can have more impact in terms of crop diversification, irrigation management and productivity and profit gains compared to the rice (Kharif, wet) season. Engagement will be both pre-season and focused on timely supply of quality inputs, and mid-season and focused on output players such as traders, transporters, millers and other processors. This strategy is in keeping with the U-impact pathway proposed by Dixon et al, (2007) and will provide a sequential logic to the organisation of activities.

Initial meetings of the local Innovation Platforms (see Appendix D section 9) will be held at the node level with the participation of farmers, local service providers (equipment, output market services, credit etc.) and agro-dealers to discuss farmer problems, bottlenecks in the principal local agricultural value chains. District level multi-stakeholder forums will incorporate key agents from the local forums, and will incorporate district-level policy makers and agri-business representatives. One of the incentives for agri-business and service provider participation will be the capacity training provided by the SRFSI project, including capacity building with respect to business models which will be designed and provided by Agrevolution and iDE.

Hub level engagement with agribusinesses seeks to strengthen business relationships with farmer groups to encourage, amongst other things, bulk buying and selling built on a mutually sustainable service fees. At a district level, private sector engagement will seek to strengthen linkages between these village level micro-enterprises and their suppliers and purchasers positioned in larger markets.

A number of strategies will be explored to improve access and availability of CA machinery for farmers and micro-entrepreneurs. This will be through the following:

* On-going engagement with machine manufacturers to align equipment requirements with availability and explore new avenues of market opportunities;
* Development of “seed funding” (revolving funds) for farmer groups to assist with the purchase of their own machines, and then pay the funds back;
* Engagement with rural agriculture banks (e.g. NABARD and YES Bank) for credit programs which can be accessed by farmers and micro-entrepreneurs (and set up and run some pilot financing models); and
* Engagement with relevant government agencies about suitable subsidies and how they can best be accessed and used.

## 5.2 Activities and outputs/milestones

### Objective 1: Understand farmer circumstances with respect to cropping systems, natural and economic resources base, livelihood strategies, and capacity to bear risk and undertake technological innovation.

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| No. | Activity | Outputs/  Milestones | Due date of output/ milestone | Risks / assumptions | Applications of outputs |
| 1.1 | Identify representative communities, farming systems and farmer requirements in the target districts to orient project activities. | 1. Survey results presented at inception workshop. 2. Project communities identified in each District. 3. Working document characterizing farming systems, institutional support and farmer problems in each District. 4. Synthesis document comparing and summarising farming systems, institutional support and farmer problems across the 8 districts | 1. May 2014 2. April 2014 3. June 2015 4. Dec 2015 | * Adequate personnel to manage the survey work can be found at short notice. | * Results used to ensure project activities are conducted in representative communities. * Results allow the identification of potential partner institutions in each District |
| 1.2 | Evaluate and document factors influencing household access to irrigation water | 1. Surveys conducted in all 8 Districts 2. Synthesis working document published | 1. June 2015 2. Dec 2015 | * Farmers are willing to openly discuss social issues restricting water access. | * Understanding used to plan and program project activities on supplementary irrigation to assure more equitable irrigation solutions. |
| 1.3 | Characterise and quantify local water resources in the project target areas. | Working document on water resources in the project communities produced. | June 2017 | * As for sub-activities 1.3.1 and 1.3.2 | * Used to define potential for scaling out of project results on supplementary irrigation |
| 1.3.1 | Assess local water balances, depth of water table, and estimates of ground water availability. | 1. Reports on water table and groundwater availability prepared for each node. 2. Data on ground water and water table levels shared with IWMI/LWR2012/079 | * First report Dec 2015 * Second report Dec 2016 | * Farmers allow piezometers to be installed or their deep wells used for water level readings. | * Information used to calculate sustainable levels of water resources in each District. * Information shared with LWR2012/079 to enhance that projects database. Meso-level water resource calculations emanating from that project feed back into SRFSI. |
| 1.3.2 | Quantify surface water resources, | Quantity of surface water each month outside the monsoon documented for each node (2+ years data) (part of 2014; 2014/15; 2015/16 | Dec 2016 (Initial data available Aug 2015) | * Assume there is relative consistency in surface water resources over the two years. | * Information used to prioritise pump types and water distribution systems for supplementary irrigation in each node. * Information used for estimation of local water resources. |

### Objective 2: Develop, with farmers more productive and sustainable technologies that are resilient to climate risks and profitable for smallholders.

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| No. | Activity | Outputs/  Milestones | Due date of output/ milestone | Risks / assumptions | Applications of outputs |
| 2.1 | Assess and document bottlenecks and entry points for the establishment of CA systems through farmer consultations and participatory technology evaluations. | 1. Presentation on bottlenecks and entry points at Inception Workshop 2. Draft working document on bottlenecks and entry points in each District available by first local E&PM[[24]](#footnote-25). 3. Published paper on CA bottlenecks and entry points in the EGP before the end of the project. | 1. May 2014 2. May 30, 2014 3. Dec 2017 | * Assume that CA will be the main project technological thrust. * Farmers are willing to discuss their circumstances and how they limit technology preferences. | Results guide the technology development process. |
| 2.2 | Evaluate costs, benefits, and climate resilience of current and innovative management technologies (e.g. CA, site-specific nutrient management, supplementary irrigation) for different farmer groups through on-farm evaluations and simulation models. | 1. Trial and demonstration protocols developed at each local E&PM. 2. Planned trials and demonstrations established on farmers’ fields each season in all communities. 3. Summary report from each node at the end of the project, together with all data, curated and in electronic format. 4. Working document on costs, benefits and climate resilience of at least three technologies across the EGP prepared by project end. | 1. Each season. 2. Each season 3. June 2018 4. June 2018 | * Node farmers (both women and men) are willing to conduct trials and demonstrations on part of their land. * Extreme climatic or exogenous events allow representative results from trials. | Results used to define whether technologies should be scaled-out or need further modification/adaptation.  Farmer managed participatory trials produce robust technologies for validation and scaling out.  Field trials and demonstrations will be utilised for field days and farmer exchange visits. |
| 2.2.1 | Develop with farmer participation profitable options for the efficient management of CA systems, including site-specific nutrient management and system intensification, especially in the winter. | Report on previous seasons trial results prepared and presented at each local E&PM | Each local E&PM | * Assume that CA continues to be the main project technological thrust. * Assume that if CA is not prioritised, other technologies will replace it. * Nutrient sources (e.g., fertilisers and manure) are available and accessible for smallholder farmers in the project communities. | Feed into future planning and overall Activity 2.2 above |
| 2.2.2 | Assess the options for increasing system productivity and resilience through strategic supplementary irrigation, and assess the feasibility for different groups of farming households. | 1. Report on previous seasons trial results prepared and presented at each local E&PM, especially those for the winter season. 2. Socio-economic assessment of irrigation feasibility for representative smallholder farm households reported by August 2015. Updated each year. 3. Working paper on the feasibility of smallholder supplementary irrigation in the EGP prepared by project end. | 1. Each winter season local E&PM 2. August 2015 onwards. 3. June 2018. | Water resources for irrigation are available and accessible for smallholder farmers in the project communities. | Drives the planning of winter cropping intensity research work in Activity 2.2. |
| 2.2.3 | Monitor soil quality in on-farm trials to assess the environmental impact and sustainability of technological options. | 1. Initial report on soil status available for parameterisation of the APSIM model. 2. Final report on the effect of key technological options on soil quality. | 1.Dec 2014  2.June 2017  3. June 2018 | * Project partners train staff to correctly take soil samples * Analytical precision of laboratories in the EGP with respect to soil carbon, nitrogen, pH, and plant available nutrients, and other soil parameters is adequate | * Sustainability of key technological options promoted by the project is assessed. * APSIM model parameterised and validated for assessing the sustainability of management options. |
| 2.2.4 | Evaluate costs, benefits, risks and resilience of researched technology options with simulation models | Results on model validation and benefits, risk and resilience of technology options reported at all local E&PM from April 2015. | Each local E&PM from April 2015. | * Data is available or can be obtained to parameterize the APSIM (or other) model(s). * Models are validated for District conditions. | Results will help prioritise research and demonstration avenues and help define scaling-out domains. |
| 2.2.5 | Evaluate farmer appreciation of costs, benefits, risks and resilience. | Reports of results of FGD at each local E&PM from April 2015 | Each local E&PM from April 2015. | Farmers are willing to take the time to discuss their views of the technologies. | Results feed into the planning of the following season’s field work, and help prioritise technological options. |
| 2.3 | Adapt ICT-based decision frameworks for crop and nutrient management in the target regions for maize, rice, and wheat. | See sub-activities. |  |  |  |
| 2.3.1 | Develop and refine ICT-based decision tools for nutrient and crop management. | Removed |  |  |  |
| 2.3.2 | Access information to establish the methods and value of integrating remotely-sensed information and weather forecasts into decision frameworks for crop selection and optimal nutrient management within the farming system. | Removed |  |  |  |
| 2.3.3 | Develop decision support tools through crop and soil simulation modelling | 1. First approximation decision tools for winter crop choices and at least two winter crop management options available for four districts by local winter E&PM in 2015. 2. Decision tools for winter crop choice and at least two management options used to establish validation trials in all districts in 2016/2017. 3. Report on decision support tool validation prepared by three months after the end of the project. | 1. Oct 2016 2. Feb 2017 3. Sept 2017 | Calamitous weather events in the first two winter seasons do not prevent relevant and representative data acquisition. | Decision support tools used for farmer demonstration and reducing the riskiness of technologies scaled out. |
| 2.4 | Adapt and evaluate CA implements for small tractors. | New prototypes produced by regional manufacturers and purchased for the project. |  |  |  |
| 2.4.1 | Acquire promising equipment and new prototypes for evaluation | 1. Equipment purchased for CA trials and demonstrations before the first summer season 2. New prototypes acquired as produced by regional manufacturers. | 1. June 2014 2. From 2014 on. | * Project funds flow soon enough for equipment purchase prior to the 2014 summer season. * New CA equipment prototypes are produced by manufacturers in the region. | Equipment used for all trials and demonstrations, and made available to node communities to conduct their own tests and experiences. |
| 2.4.2 | Conduct participatory machinery evaluation events | At least one participatory (farmers, manufacturers, project personnel) CA equipment evaluation conducted and reported in each District each season | Each season from summer 2014 | Project funds flow early enough to allow for equipment purchase for the project trials and evaluations. | Equipment adjustments and modifications shared with manufacturers for inclusion in new prototypes. |
| 2.4.3 | Support machine development and manufacturing activities. | New machines based on testing in the EGP are produced in South Asia. | Aug 2016 | Equipment manufacturers are prepared to invest in the development of CA implements for smallholders in the EGP | Improved equipment allows for better technology performance and increased profitability. New machines used for demonstration plots and farmer demonstrations. |
| 2.4.4 | Test and demonstrate the efficiencies of laser levelling on small fields. | 1. Results of field tests of laser levelling documented. 2. Bulletin produced on the efficiencies allowed by laser levelling of small fields. | 1. May 2014 and May 2015. 2. Dec 2015 | Farmers allow the levelling of their small fields. | Information feeds into the technology options for demonstration if laser levelling shows important increases in water use efficiency in small fields. |
| 2.5 | Evaluate pumps including those using alternative energy sources, and water distribution systems adequate for smallholders and service providers in the EGP | 1. Tests of low-cost pumps suitable for smallholder farmers comparing mechanical and fuel efficiency documented. 2. Participatory (farmer and service provider) evaluations of suitable pump options for smallholders conducted in at least two communities in each district. 3. Reports on participatory (farmer and service provider) testing of suitable pump options. | 1. May 2014 and later as options become available 2. Mar 2015 3. June 2018. | Different pump set options become available for testing. | Efficient pumps, suitable for smallholder farmers and service providers working with smallholder farmers, are a key to the feasibility of supplementary irrigation by smallholders. Identified pump sets and conveyance (piping) will be scaled out through the out-scaling project. |

### Objective 3: Catalyse, support and evaluate institutional and policy changes that establish an enabling environment for the adoption of high-impact technologies from Objective 2.

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| No. | Activity | Outputs/  Milestones | Due date of output/ milestone | Risks / assumptions | Applications of outputs |
| 3.1 | Assess and document farmer decision processes for investing in key climate-resilient technologies, including the role of risk and perceptions. | 1. Report from RRA and surveys on farmer perceptions of the agronomic and institutional feasibility of available rice and wheat technologies, and supplementary irrigation. 2. Results of FGD on technology acceptability and institutional feasibility presented at local E&PM for the 2016 winter season. 3. Survey in project communities and synthesis report on early adopters and non-adopters of project-promoted system enhancing technologies. 4. Synthesis report on farmer decision making processes in 8 districts of the EGP. | 1. May (rice) and Sept 2014 (Wheat and supplementary irrigation) 2. Sept 2016 3. June 2018 4. June 2018. | Sufficient pool of adopters and non-adopters identified to characterize decision-making processes. | Adoption constraints and enabling conditions inform out-scaling strategy in Objective 4, including partnership model and technical priorities. |
| 3.2 | Initiate and establish innovation platforms in each project district incorporating farmers and agents representing many of the principal components of the main agricultural value chains. | 1. Discussion groups of farmers and value chain agents held in each node in each season. Issues and decisions on institutional and technological problems (and possible solutions) documented, including timetable for future meetings. 2. District officers able to implement policy support to scaling of CASI innovations 3. Enabling environment for CASI scaling improved through briefings with State Level officials 4. Reporting on the facilitation of state level meetings for CASI scaling. This will be done across the four ‘states’, and form a linkage between the provincial level ‘Roadmaps’ SRA (e.g. in Nepal) and proposed regional CASI platform that CIMMYT will facilitate with NARC. | 1. Sept 2014, March 2015, Sept 2015, Mar 2016, Sept 2016 and Mar 2017 2. Jun 2019 3. Jun 2019 4. June 2020 | Agents representing the principal bottlenecks/opportunities in the main local value chains are amenable to participation in the innovation platform. | Partners understand the value of collaboration to reach common goals. |
| 3.3 | Evaluate service provider models and systems for different farmer groups, especially women farmers. | Effectiveness of linkages between women farmers and service providers assessed through key informant surveys in at least four districts. | 1. December 2014 2. May 2015 | Women farmers are reluctant to assume non-traditional roles or still lack the social capital or mobility to effectively engage with service providers and agro-dealers. | Development and private sector partners understand the importance of linking women farmers more broadly to knowledge and service networks. Expands out-scaling possibilities in Objective #4. |
| 3.4 | Strengthen CA and irrigation business models for service providers to efficiently address the needs of different farmer groups, especially women farmers, through support and training by both the public and private sectors. | 1. Women farmers in four districts effectively linked to service providers with the skills to negotiate prices, understand the value of key technologies, etc. 2. Syllabus and training modules for technical and business development services formalized in consultation with partners. 3. At least one course on Technical and business development services conducted for service providers in four districts. 4. Training modules for technical and business development services formalized in consultation with partners. | 1. November 2014 2. May 2014 3. Dec 2015 4. June 2020 | Demand for new services lags behind supply. | 1. Training of service providers is a key component of the project’s scaling-out strategy. 2. Stand-alone training modules for service providers are deployed within and beyond the project areas. |
| 3.5 | Develop markets for inputs and services in the target areas. | 1. Backward linkages in input chains strengthened by providing market intelligence to private companies and through exposure visits linking private companies to newly developing commercial pockets. 2. New approaches for marketing and demand aggregation implemented to ensure that smallholders have improved access to mechanized service provision. | 1. August 2014, 2015 2. October 2014 | 1. Companies come forward to expand their distribution and support networks in the prioritized ecologies. 2. Emergence of sufficient number of strengthened and new service providers. | Small and larger-scale partners invest their own resources to expand the availability of critical inputs and services in the broader project areas, enabling and supporting out-scaling in Objective #4. |
| 3.6 | Develop policy roadmaps for the sustainable development and use of water resources along with increased market-based access to scale-appropriate agricultural machinery. | Discussions held with stakeholders, including policy makers at the local, regional and national levels of policy to develop options to enhance the profitability and sustainability of smallholder agriculture in the EGP. | June 2017 |  |  |
| 3.6.1 | Develop policy roadmaps for the sustainable development and use of water resources. | 1. Working document published on policy options for the sustainable use of water resources in the eight (SRFSI) districts of the EGP. 2. Policy brief prepared on options for the sustainable use of water resources in the EGP. 3. Reporting on the policy options for the sustainable use of water resources in the eight (SRFSI) districts of the EGP. | 1. June 2015 2. Dec 2016 3. June 2020 | Trade-offs between political interests and economic/social gains. | Dialogues on policy alternatives brought to local, state, and national governments, potentially creating a better enabling environment to sustained innovation. |
| 3.6.2 | Assess policies regulating the market availability of small farm equipment and explore with stakeholders options to overcome bottlenecks in equipment availability. | 1. Document published on the policies regulating the markets of small farm equipment in the EGP. 2. Reports of stakeholder discussions on overcoming policy and institutional bottlenecks in equipment availability in districts where this is an identified problem. 3. Report assessing the policies regulating market availability of small farm equipment and explore with stakeholder’s options to overcome bottlenecks in equipment availability. This will have synergies with the ‘Roadmaps’ SRA which will look at how to implement these recommendations at provincial level. | 1. June 2015 2. Mar 2016 3. June 2020 | Access to complementary factors, such as financing for equipment to manufacturers and stakeholders. | Dialogues on policy alternatives brought to local, state, and national governments, potentially creating a better enabling environment to sustained innovation. |

### Objective 4: Facilitate widespread adoption of sustainable, resilient and more profitable farming systems.

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| No. | Activity | Outputs/  Milestones | Due date of output/ milestone | Risks / assumptions | Applications of outputs |
| 4.1 | Establish on-farm technology validation and learning modules and use these to help build stakeholder capacity. | 1. Document describing the objectives and conformation of the learning modules discussed and finalised at the Inception Workshop. 2. Protocols for learning modules prepared in each district at the 2014 summer planning meeting in each state/country. 3. Learning modules established in each node each season 4. Technical bulletin prepared with results and discussion of learning modules 5. Synthesis reports on CASI and Socio economic report produced 6. Enhance local knowledge of CASI practices through organization of 20 focus group discussion (FGDs) in kharif and rabi season 7. Producing synthesized research results and synthesized lessons from the local uptake of CASI | 1. May 2014 2. May 2014 3. Each season from summer 2014 4. Dec 2017 5. September 2017 6. Dec 2017-June/Dec 2018- Mar 2019 7. Jun 2018 | Farmers allow the establishment of learning modules on their farms  Partners provide quality data and synthesis reports on a timely manner | Learning modules provide material and demonstrations for courses and knowledge development of farmers, research and development partners, course participants and other scientific and technical visitors.  Knowledge enhanced and feedback gained about CASI technologies to be revised or addressed. |
| 4.2 | Develop and enhance the capacity of local researchers and change agents from both the public and private sectors to manage the participatory development of sustainable technologies within the context of local innovation systems. | See sub-activities. |  |  |  |
| 4.2.1 | Conduct CA courses for project partners in each country at the start of the project. | All initial project partners participate in courses on participatory on-farm research, gender sensitivity in research and agricultural extension, innovation systems, conservation agriculture and other topics. | May/June 2015 | Project start-up is not delayed past May 1, 2014 to allow time for organization of courses.  Project partners can free time from their pre-planned schedules | Used to ensure all project partners understand the best-bet technologies, the management of participatory on-farm trials and demonstrations and their roles in the project and in the node communities. |
| 4.2.2 | Provide further training opportunities to potential CA champions through the CA course in India | Eight project partners attend CA course in India each autumn from 2014 | Each Oct from 2014. | The CA course in India continues to be held by CIMMYT | Used for preparing leaders in CA technology. |
| 4.2.3 | Provide further capacity building and stimulus to outstanding CA champions in the region. | One highly-motivated partner from the EGP attends 6-week course in Mexico each May from the second year of the project. | Each May from 2015 | The CA course in Mexico continues to be held each year.  CIMMYT accepts a candidate from the EGP each year for this course that caters for restricted numbers. | Used for preparing and stimulating leaders in CA technology in the EGP. |
| 4.2.4 | Support and mentor project partners in key research and capacity building activities through linkages with Australian university personnel. | Australian University professors attend Inception Workshop and Planning Meeting and develop joint research plans and protocols with project staff. | May 2014Oct 2014,  2015, 2016. | Australian university professors are able to attend the Inception Workshop | Channel opportunities for Australian expertise into the project.  Provide opportunities for joint projects between NARS in the EGP and Australian universities. |
| 4.2.5 | Make an inventory of capacity development initiatives relevant to SRFSI and with similar target beneficiaries (farmers, self-help groups, local researchers, change agents, service providers, agri-business, value chain actors and decision makers) | 1. Overview of key programs, actors and further initiatives aiming to support CD for sustainable intensification and/or in the EGP 2. Overview, and database, of existing CD materials relevant to CASI 3. Overview of key programs, actors and further initiatives aiming to support CD for sustainable intensification and/or in the EGP. | 1. Nov 2017  2. Nov 2017  3. June 2020 | Partners are willing to share materials and best practices | Build and strengthen (potential) strategic partnerships to exchange CD best practices, methodologies, and materials to and from SRFSI.  Improve the quality and quantity of CD materials offered by SRFSI |
| 4.2.6 | CD needs assessment for SRFSI target beneficiaries | 1. Capacity gap assessment and CD priorities established with key partners; report and workshop  2. Assessment of threats and opportunities for scaling CASI innovations and associated capacity gaps | 1. Nov 2017 2. Feb 2018 | Able to get a representative sub-set of partners and responses | Allows for targeted investment in capacity development at individual, organisational and institutional level.  Provides a benchmark for M&E on CD |
| 4.2.7 | Develop a CD strategy and implementation plan in collaboration with partners | 1. CD strategy and implementation plan developed with, and approved by, key partners; report and workshop.  2. Capacity development strategy and implementation plan developed with, and approved by, key partners; report and workshop. | 1. March 2018  2. June 2020 | Partners are willing to participate in the development and implementation of the CD strategy | Joint strategy and implementation plan for partners to align with and reinforce |
| 4.2.8 | Development and set up of a Strategically Commissioned Grant Scheme to finance partner capacity building activities | 1. Strategically Commissioned Grant Scheme (SCGS) developed and communicated to partners  2. Eligible partners have drawn at least 80% of available funds from the SCGS to implement capacity building activities | 1. March 2018  2. June 2019 | Partners are willing to participate in the development and implementation of the SCGS | Joint strategy and implementation plan for partners to align with and reinforce |
| 4.2.9 | Develop CD materials that are prioritised to improve the enabling environment for scaling | CD materials developed for at least 3 priority topics identified by stakeholders | Dec 2018  June 2020 | Some CD materials on priority topics are likely to be available and just need to be updated (findings from 4.2.5 the inventory) | CD materials available to project partners and others for further use within and beyond project |
| 4.2.10 | Support adoption of CASI innovations through capacity building by qualified trainers | 1. Assessment and/or Training of 15 trainers in 4 geographies before the 2017/18 Rabi season 2. Trainers train 800 beneficiaries before and during the 2017/18 Rabi season 3. Trained 10 lead farmers, service providers, others to become future trainers (ToT) on CASI technologies. 4. Trained 40 service providers and 10 small scale entrepreneurs on priority topics. | 1. Oct 2017 2. Nov 2017 3. Sep 2018 4. Dec 2018 | * Service providers see value on participating. * Sufficient qualified trainers available (including women) | Farming service providers are better prepared to provide services to both men and women smallholder farmers and thus enable the scaling out of recommended technologies. |
| 4.2.11 | Implement trainings on priority areas defined with key stakeholders | 1. Trainings on at least 3 priority topics implemented for at least 400 beneficiaries | Jun 2019 | * Partners have qualified trainers available | Capacity of key individuals, organizations and institutions is improved for a more conducive environment towards scaling |
| 4.2.12 | Monitor, evaluate and learn from CD measures implemented and ensure feedback to improve processes and allow better integration in programs supporting CASI | 1. Progress on CD measures included in 6-monthly M&E framework of SRFSI  2. Feedback integrated in ongoing and future training activities | From Dec 2017 every 6 months |  | M&E&L allows steering and learning from the project. Outputs are critical for smooth integration of CD measures in ongoing activities and other initiatives (e.g. CSISA, etc.) |
| 4.2.13 | Adoption study CASI innovations | 1. Study designed, indicators agreed upon with ACIAR and partners, and target group defined 2. Implementation of adoption study and presentation of results | 1. July 2018 2. Dec 2018   June 2021 | Consensus on definition of CASI and adoption of CASI is reached | Intermediary check on adoption rates reached as an important indicator of project success  Important evidence to better target the promotion of CASI |
| 4.2.14 | Scaling pathways to enhance the adoption of CASI assessed and reported for various farming systems and contexts | 1. Scaling assessment report recommending priority areas for capacity development 2. Implementation of capacity building activities on topics identified in the scaling assessment 3. Scaling indicators set up and monitoring system build up around that to learn from different scaling models prevailing in the project area 4. Partners built capacity on principles of scaling and integrate those in their programming 5. Level and extent of convergence of CASI with NARES plans/schemes assessed and reported. 6. Report on the extent of convergence of CASI with NARES plans/schemes. This will then be used to inform work stream 5 on pathways forward. 7. Scaling assessment report recommending priority areas for capacity development, recommendation for implementation of capacity building activities on topics identified in the scaling assessment. | 1. February 2018 2. June 2019   June 2020   1. March 2018 2. June 2019 3. June 2019 4. June 2020 5. June 2020 | * Partners’ reports clearly defines the adoption of CASI technologies using distinct scaling pathways * Partners are willing to integrate CASI technologies in their regular plans. | NARES partners have clear understanding on the importance of scaling pathways. |
| 4.3 | Enhance the capacity of local change agents, including service providers and agro-dealers, to support smallholder farmers through technical training, business development services, and improved linkages to knowledge providers in the public and private sector. | Local change agents have improved linkages to knowledge providers and information systems, and have benefitted from business development services and technical training. |  |  |  |
| 4.3.1 | Build the capacity of change agents in the region, especially agro-dealers and self-help groups, to facilitate farmer knowledge development, through short courses, field evaluations, farmer discussion groups and access to high quality technical and economic information relevant to the region. | Two-day course held for 25 change agents (incl. agro dealers and SHG) in each district – one in each of the first three seasons of the project | May 2014,  Sept 2014  April 2015 | Change agents are permitted to take time off duties to attend courses.  There is sufficient interest in courses to populate the seasonal courses. | Capacity building forms the foundation for scaling up (methodologies) and scaling out (technologies) of project outputs. |
| 4.3.2 | Develop the capacity of local service providers to provide efficient irrigation and crop management services that directly and indirectly contribute to resilience, sustainable intensification and increased farm profitability. | Three-day courses held in each of the first three seasons of the project in each District for approximately 10 service providers. | Sept 2014,  Sept. 2015  Dec 2015 | Service providers are willing and able to take the time to attend courses. Course timing may need to be adjusted to enhance attendance. | Capacity building of service providers is the vehicle for enhancing adoption of “service-based” technologies, such as CA and supplementary irrigation. |
| 4.3.3 | Build the technical capacity and innovation linkages of local businesses through training and support on new or modified services to smallholder farmers | 1. Stand-alone training modules for service providers are developed and shared within and beyond the project areas. 2. Conduct training for Business Facilitators (BF x 8) and assist with deployment across locations 3. Conduct business model training with micro-entrepreneurs focussing on business model development | 1. April 2018   June 2020   1. May/Sep 2018 2. May/Sep 2018 | * Civil unrest does not hamper rural activities. * Australian dollar maintains its value against the US$ and local currencies. | Business models help service providers identify and implement new business options that provide required service options to men and women smallholder farmers, while offering also increased income to service providers. |
| 4.4 | Improve agro-dealers and service providers’ market intelligence on new opportunities in the target regions through better linkages with ‘upstream’ value chain actors. | 1. Bulletins of project results shared with major dealers and input suppliers (State level) to increase awareness of demand for new inputs. 2. Major distributors and dealers furnished with lists of local agro-dealers prepared to stock and manage updated input inventories. 3. CD materials developed and deployed 4. Bulletins of project results shared with major dealers and input suppliers (State level) to increase awareness of demand for new inputs. | 1. Feb 2015 2. Feb 2015   June 2020   1. May 2018 June 2020 2. June 2020 | Climatic conditions permit plausible field results from the project in the first two seasons. | Linkages between major distributors and local agro-dealers will enhance the possibilities of local dealers stocking relevant inputs and equipment for project technologies. |
| 4.5 | Facilitate farmer-to-farmer information exchange through demonstration plots and field days in each project community where public, private, and NGO partners play roles as facilitators and work to strengthen farmer-to-farmer knowledge exchange. | Farmer interest in project technologies stimulated through observation and peer explanations in field days. | Summer 2014 and winter 2014/15. | Field and climatic variability are within expected limits allowing adequate demonstration of technology performance. | Preparing partners and other change agents for a key role in the scaling out of project technologies. |
| 4.6 | Through various knowledge/ experiences sharing events and syntheses reports with field level evidence, etc. inform to SDIP II | 1. Shared experiences/knowledge of SRFSI in a regional SDIP dialogue.  2. Synthesis research and socio-economic reports prepared and circulated  3. Field based evidences on Food, Energy and water nexus generated and shared  4.Interim research review conducted  5.Final technical review of SRFSI | 1 and 2, June 2018, and 2019.  3.Feb/March 2018  4.April 2019 | Field evidences around food, energy and water nexus are significantly contributing to SDIP II objectives | SRFSI is a key component of SDIP |
| 4.7 | Facilitate, and participate in, the reviews commissioned by ACIAR | 1. Synthesis reports on CASI agronomy and socioeconomic research completed 2. Implementation strategy on testing and evaluating the hypothesis that “knowledge of farmers, service providers and decision makers is a major limiting factor to scaling CASI”, 3. Recommendations from Rabi capacity development campaign documented 4. Documentation for final review available. 5. Recommendations from Rabi capacity development campaign documented 6. Testing and evaluating the hypothesis that “knowledge of farmers, service providers and decision makers is a major limiting factor to scaling CASI”. | 1, 2 and 3. Feb 2018  4. March 2020  5. June 2020  6. June 2020 | Partners provide quality data and synthesis reports on a timely manner | Inform the steering of the project  Informs other projects with lessons learned from SRFSI |

### Variation 4 Activities

Variation 4 will implement five interrelated work streams. The first four work streams relate to existing deliverables, while the fifth provides a platform in which to synthesise and set the agenda for future research. Under this plan, all deliverables established in the SRFSI variation three project document will be finalised before the end of the final year (30 June 2020).

*Work stream 1: Convergence Activities*

This work stream will address the remaining deliverables in relation to policy and convergence. This addresses the most identified weakness of an analysis of project impacts in the external review (pg40) in a lack of alignment of government policies.

**3.2** – Reporting on the facilitation of state level meetings for CASI scaling. This will be done across the four ‘states’, and form a linkage between the provincial level ‘Roadmaps’ SRA (e.g. in Nepal) and proposed regional CASI platform that CIMMYT will facilitate with NARC.

**3.6.1** – Reporting on the policy options for the sustainable use of water resources in the eight (SRFSI) districts of the EGP.

**3.6.2** – Report assessing the policies regulating market availability of small farm equipment and explore with stakeholder’s options to overcome bottlenecks in equipment availability. This will have synergies with the ‘Roadmaps’ SRA which will look at how to implement these recommendations at provincial level.

**4.2.14** – Report on the extent of convergence of CASI with NARES plans/schemes. This will then be used to inform work stream 5 on pathways forward.

*Work stream 2: Institutionalisation of CASI capacity development*

This work stream will address the remaining deliverables in relation to the institutionalisation of CASI capacity development activities. This will focus on understanding the capacity gaps for capacity development and establishing strategies that can address these gaps, including through increased regional collaboration. It builds on what was done at the start of the scaling variation (3), and synthesise learning from capacity development activities over 2018-2019.

**4.2.5** - Overview of key programs, actors and further initiatives aiming to support CD for sustainable intensification and/or in the EGP.

**4.2.14** - Scaling assessment report recommending priority areas for capacity development, recommendation for implementation of capacity building activities on topics identified in the scaling assessment.

**4.2.7** – Capacity development strategy and implementation plan developed with, and approved by, key partners; report and workshop.

**4.7 -** Recommendations from Rabi capacity development campaign documented.

*Work stream 3: Scaling products*

This work stream will address the remaining deliverables in relation the creation of legacy scaling products. It covers two separate yet interrelated aspects: Syllabi development and promotional materials. This Workstream addresses the recommendation (iii; pg47) of the SRFSI external review for increased emphasis on communications materials. For Syllabi development, the following will be addressed:

**3.4** – Training modules for technical and business development services formalized in consultation with partners.

**4.2.9** - Capacity development materials developed for at least 3 priority topics identified by stakeholders.

**4.3.3** - Stand-alone training modules for service providers are developed and shared within and beyond the project areas.

**4.4** - Capacity development materials developed and deployed - Improving agro-dealers and service providers’ market intelligence on new opportunities in the target regions through better linkages with ‘upstream’ value chain actors.

In addition to this, this work stream will also cover the creation of promotional materials as follows:

**4.4** – Bulletins of project results shared with major dealers and input suppliers (State level) to increase awareness of demand for new inputs.

**4.4** – Major distributors and dealers furnished with lists of local agro-dealers prepared to stock and manage updated input inventories.

*Work stream 4: Adoption and Impact*

This work stream will renew focus on the explorations of adoption and impact. The core focus will be on understanding what has worked where and why. A framework will be developed that will be widely applicable for exploration to various adoption studies more broadly, and piloted within SRFSI intervention areas. This will build on prior methodologies (for example, [Brown et al., 2017](https://www.dropbox.com/s/rcn7de51ub9z0g3/1.%20Stepwise%20Frameworks%20%28AGSY%29.pdf?dl=0)). There will also be an exploration of inclusiveness (from perspectives of both gender and youth) to understand the impact of CASI uptake on subpopulations. This will be based on prior developed methodologies (for example, [Brown et al 2018](https://www.dropbox.com/s/j7ur68yydo06z0v/3.%20Negative%20Evaluation%20%28IJAS%29.pdf?dl=0)). Specifically, this work stream will address the following deliverables:

**4.2.13** - Adoption Study: designed, indicators agreed upon with ACIAR and partners, and target group defined; Implementation of adoption study and presentation of results.

**4.7** - Testing and evaluating the hypothesis that “knowledge of farmers, service providers and decision makers is a major limiting factor to scaling CASI”.

**4.2.14** - Scaling indicators set up and monitoring system build up around that to learn from different scaling models prevailing in the project area.

*Work stream 5: Synthesis activities*

This work stream is distinct from the other four proposed work streams as it not explicitly based on the established deliverables from the variation three project document. Its purpose is to provide a platform for synthesis and agenda setting and to in turn develop a research agenda for future work in the EGP. To do this, it will essentially synthesise all SRFSI work as well as provide a platform for integration of other SDIP2 project outputs. Specific activities include:

**New** – Dialogue with various stakeholders on the pathways forward for CASI ‘vision 2030’. This may also include ‘truthing’ with end user groups through ‘best-worst’ scaling of constraints to CASI uptake. It will also include some minor roadmapping exercises that include network analysis and development of plans for policy interventions and institutionalisation of capacity building.

**New** – Dialogue with SDIP2 partners for integration and agenda setting for SDIP3.

**4.7** - Final review documentation available.

## 5.3 Project personnel

### 5.3.1 List of participants involved in the project

***Australian commissioned and collaborating organisations (or IARC)***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Sex**  **(m/f)** | **Agency and position** | **Discipline and principal role in project (support roles)** | **Time input (%)** | **Funding** |
| Thakur P. Tiwari | M | CIMMYT, Systems Agronomist | Agronomist, Project Leader, chair of the PCC. | 60% until June 2018, and 80%, onwards | ACIAR |
| Mahesh K Gathala | M | CIMMYT, Systems Agronomist | Agronomist, Science Coordinator. | 100% until Sept 2017, 70% from Oct 2017 to June 2018, and 30% onwards | ACIAR |
| Andrew McDonald | M | CIMMYT, Agronomist and SI Strategic Research Team Leader - South Asia | Agronomist, strategy support, regional linkages. | 7% from payments 1-3  0% from July 2015 onwards | ACIAR |
| Ashraf Ali | M | CIMMYT, Project Manager | Project management and M&E. Secretary of the PCC. | 100 | ACIAR |
| TBD |  | CIMMYT Monitoring and Learning (M&L) expert | Demonstrated high level skills and experience in capacity development programs. Development of strategies in collaboration with partners. Quality control of capacity development measures | 100  From January 2018 | ACIAR |
| Sofina Maharjan | F | Research Associate | Expertise in Social science aspects and engaged in Objectives 1, 2, and 4 | 100 | ACIAR |
| Santu Das |  | Local Communication specialist | Integrate communication activities across the project for relevant communication activities for scaling | 100  From Sept 2017 | ACIAR |

***Partner country institution(s) or collaborating IARC***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Sex**  **(m/f)** | **Agency and position** | **Discipline and role in project** | **Time input (%)** | **Funding** |
| Ranvir Kumar | M | Bihar Agricultural University, Asst. Prof., BPS Agriculture College, Purnea | Agricultural Economist,  Objective 3 (Objective 4) | 30 | BAU |
| Sanjay Kumar | M | Bihar Agricultural University, Assoc. Prof., Department of Agronomy, BAC Sabour | Agronomist, Objective 4, focus on capacity building as of Sept 2017 | 25 | BAU |
| Ram Datt | M | Bihar Agricultural University, Assistant Prof., Department Agric. Extension, BAC Sabour | Social Scientist, Objectives 1 and 3  (Objective 4) | 20 | BAU |
| Pawan Kumar Srivastwa | M | BAU, Research Associate, Purnea | Day-to-day management and data acquisition of on-farm research activities. Objective 2, (Objectives 1 and 3) | 100 | ACIAR 100% |
| Apurba K. Chowdhury | M | UBKV, Professor | Plant pathologist, On-farm research and coordination, West Bengal.  Objective 2. | 25 | UBKV |
| Kalyan Kanti Das | M | UBKV, Assistant Professor | Agricultural economist, Objectives 1and 3 (Objectives 2 and 4) | 25 | UBKV |
| Prateek Bhattacharya | M | UBKV, Assistant Professor, Coochbehar | Plant pathologist and CA specialist, Objective 2. | 25 | UBKV |
| Tapamay Dhar | M | UBKV, Assistant Professor, Malda | Agronomist, Objectives 2 and 4 | 40 | UBKV |
| Kaushk Pradhan | M | UBKV, Assistant Professor | Agricultural economist, Objectives 1and 3 (Objectives 2 and 4) | 25 | UBKV |
| Biplab Mitra | M | UBKV, Assistant Professor | Agronomist, Objectives 2 and 4 | 25 | UBKV |
| T Rajashekhar | M | UBKV, Technician, Coochbehar | Day-to-day management and data acquisition of on-farm research activities in Coochbehar. Objective 2, (Objectives 1 and 3) | 100 | ACIAR 100% |
| Bablu Ganguly | M | UBKV Field Technicians, Malda | Day-to-day management of research and demonstration plots, organization of farmer discussion groups and field days etc., in three communities in Malda. Objectives 2, 3 and 4. | 100 | ACIAR 100% |
| TBD | F/M | Director Agriculture, DoA, WB, India | Director, Agriculture, WB (Objectives 1, 4) | 1 | DoA |
| Sujan Kumar Sen | M | Asst Director Agriculture, DoA, WB, India | Asst. Director, Agriculture, WB (Objectives 1, 4) | 2 | DoA |
| B.P. Bhatt | M | ICAR Eastern Region, Patna. Principal Scientist; Institute Director | Agronomist, Leadership for strategic research. Objective 2. Only CD (objective 4) after June 2018) | 5 | ICAR |
| Ujjwal Kumar | M | ICAR Eastern Region, Patna. Principal Scientist; (Social Scientist and Project PI) | Oversight responsibilities for all objectives in general and in particular objective 1 and 3. Only CD (objective 4) after June 2018) | 40 | ICAR |
| Manoj Kumar | M | Bihar Rural Livelihoods Promotion Society (JEEViKA), State Rural Livelihoods Mission (SRLM) | State Project Manager, Plant Breeder/Geneticist. Logistical and administrative support. All Objectives. | 3 | JEEViKA |
| TBD | F/M | NARC, Executive Director | Objective 4. | 5 | NARC |
| Renuka Shrestha | F | Nepal Agricultural Research Council (NARC), Senior Scientist | Expanded Objective 4. | 15 | NARC |
| Sanjeet K. Jha | M | NARC, Senior Scientist | Agricultural Engineer. Objectives 2 and 3.  (Objective 4). | 20 | NARC |
| Hari Krishna Shrestha | M | NARC, Regional Director, Tarahara, Sunsari | Agriculturist  Objective 2  (Objectives 1, 3 and 4). | 25 | NARC |
| Shudha Nepal | F | Nepal Agricultural Research Council (NARC), Planning Division | Objective 2  (Objectives 1, 3 and 4). | 15 | NARC |
| Shukra Raj Shrestha | M | NARC, Scientist | Soil Scientist/Modeller, Objective 2  (Objectives 1, 3 and 4). | 25 | NARC |
| Budh Lal Meheta,  Sanju Chaudhary (Female), Chandan Meheta, Prabhu Chaudhury,  Hari Bhattarai | 4 M, 1 F | 5 NARC Field Technicians, Sunsari (3 for DoA; 2 for NARC) | Day-to-day management of research and demonstration plots, organization of farmer discussion groups and field days etc., in two communities in Sunsari. Objectives 2, 3 and 4. | 500 | ACIAR 500% |
| Dilli Ram Sharma | M | DoA, Nepal | Director General, Objective 4 | 1 | DoA |
| DDG, DoA, Prakash Kumar Sanjel | M | Department of Agriculture, Ministry of Agricultural Development – Nepal, Deputy Director General, Planning | Deputy Director General  Objective 4 | 15 | DoA |
| Raj Kant Jha | M | DoA, MOAD – Nepal, DADO- Sunsari | SADO, Objective 4.  (Objective 4) | 20 | DOA |
| Aziz Zilani | M | MD, BARC | Contact and linkages. All Objectives. | 1 | BARC |
| Ilias Hossain | M | Regional Wheat Research Centre,  Principal Scientific Officer & Head, BARI, Rajshahi | Agronomist. Oversight and involvement in agronomic and equipment development, and training. Objective 2 (Objectives 3 and 4). | 25 | BARI |
| Akhbar Hossain | M | Sr. Scientific Officer, Wheat research Center (BARI),  Nashipur, Dinajpur-Bangladesh | Agronomist (On-farm) and adaptive trials. Objectives 2 and 3  (Objectives 1 and 4) | 30 | BARI |
| Nur-E- Alam Siddique | M | Scientific Officer, Regional Wheat Research Center (BARI),  Shyampur, Rajshahi. | Plant Breeder and R-M project In charge, On-farm adaptive trials, Objectives 2 and 3.  (Objectives 1 and 4) | 30 | BARI |
| ASM Mahbubur Rahman Khan | M | CSO, OFRD, BARI | Plant breeder. Oversight of BARI On-farm activities. Objective 2 (Objectives 3 and 4) | 5 | BARI |
| Shakhawat Hossain | M | Senior Scientific Officer (OFRD, BARI) | Agronomist, out-scaling in Rajshahi Barind. Objectives 2 and 3.  (Objectives 1and 4) | 25 | BARI |
| Mazharul Anwar | M | Principal Scientific Officer, OFRD, BARI, Rampur | Socio-economist. Implementation of out-scaling activities in one node in Rangpur. Objective 4 (Objectives 2 and 3) | 15 | BARI |
| Md Zakir Hossain | M | DAE, Bangladesh | Dy Director, DAE (Objective 1, 4) | 5 | DAE |
| Md Hazrat Ali,  Md Mohsin | M | DAE, Rangpur and Rajshahi, Bangladesh | Dy Director, DAE (Objective 1, 4) | 10 | DAE |
| Md Mozdar Hossain,  Md Abu Zafar,  Md Abdullah Al Mamun,  Md Khursedul Alom | M | DAE, Bangladesh  UAO (Upazilla Agricultural Officers) | UAO, DAE (Objective 1, 4) | 40 | DAE |
| Md. Mamunur Rashid | M | RDRS- Agriculture and Environment Coordinator | Agronomist. Will coordinate all RDRS activities in Rangpur. Objectives 2 and 3, (Objectives 1 and 4). | 5 | RDRS |
| Anup K. Ghosh | M | RDRS - Farming Systems Agronomist/Cropping Systems Agronomist | Coordination of out-scaling and training activities in Rangpur, plus inter-institutional linkages and research-extension linkages. Objective 4 (Objective 2) | 100 | ACIAR 100% |
| Md Rashadul Islam | M | RDRS, Research Associate, Rangpur | Day-to-day management and data acquisition of on-farm research activities. Objective 2, (Objectives 1 and 3) | 100 | ACIAR 100% |
| Md Shahidul Islam,  Raju Chandra Das,  Md Nazmul Hassan, Md Shahjahan | M | 4 RDRS Field Technicians, Rangpur (2 for RDRS; 2 for DAE) | Day-to-day management of research and demonstration plots, organization of farmer discussion groups and field days etc., in two communities in Rangpur. Objectives 2, 3 and 4. | 400 | ACIAR 400% |

**Australian partners**

**CSIRO**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Sex**  **(m/f)** | **Agency and position** | **Discipline and role in project** | **Time input (%)** | **Funding** |
| Peter Brown | M | CSIRO, Ecosystem Sciences, Senior Research Scientist | CSIRO Team Leader. Livelihoods specialist, decision and trade-off analysis and innovation platforms. Objective 2 and 3. | 25% | ACIAR  (co-investment) |
| Alison Laing |  | CSIRO Ecosystem Sciences, Research Projects Officer | Farming Systems Agronomist, crop modelling. Synthesis of climate resilience CASI. Objectives 2 | 30 (up to Nov 2017) | ACIAR |

**Curtin University**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Sex**  **(m/f)** | **Agency and position** | **Discipline and role in project** | **Time input (%)** | **Funding** |
| Fay Rola-Rubzen | F | Curtin University, Deputy Dean, Research & Development, Curtin Business School. | Agricultural economist and socio-economist. Analysis of farmer decision-making processes, risk behaviour, agribusiness value chain analysis, gender equity and formation of farmer groups. Participate in specialised training events. Objective3 (Objectives 2 and 4). Gender synthesis and mainstreaming | 35% | ACIAR 25%  Curtin 10% |
| Roy Murray-Prior | M | Curtin Business School, Curtin University | Agribusiness systems specialist. Support formation of farmer groups. Participate in specialised training events. Objective 3 (Objectives 2 and 4). Objective 4- bottlenecks for scaling in value chain and extension | 10 | ACIAR |

***Collaborating IARCs***

***International Food Policy Research Institute - IFPRI***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Sex**  **(m/f)** | **Agency and position** | **Discipline and role in project** | **Time input (%)** | **Funding** |
| Avinash Kishore | M | IFPRI, Research Scientist. | Agricultural economist, water and agricultural machinery policy analysis. Focus on sustainability. Objective 4. | 4 | ACIAR |

#### International NGOs

#### International Development Enterprises (iDE)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Sex(m/f) | Agency and position | Discipline and role in project | Time | Funding |
| TBD |  | iDE country rep Bangladesh | private sector dev specialist | 7% | ACIAR |
| TBD |  | iDE Bangladesh | private sector dev specialist | 60% | ACIAR |

#### Partner country institution(s) or collaborating IARC

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | Sex  (m/f) | Agency and position | Discipline and role in project | Time input (%) | Funding |
| Nominated by partner organisations | 50:50 | NGO, government and university researchers and extension agents. | Community business coordinators | 8 X 100% | ACIAR |
| Nominated by partner organisations | 50:50 | NGO, government and university researchers and extension agents. | Development coordinators | 8 X 100% | ACIAR |
| Nominated by partner organisations |  | NGO, government and university researchers and extension agents | Assist with implementation of project activities in existing and new Districts | 22 x 50% | Partners |

### Description of the comparative advantage of the institutions involved

All of partner organizations in the SRFSI project have histories and mandates that make them well suited to addressing the complex problem of developing climate-resilient farming systems in the Eastern Gangetic Plains. There are already many active collaborative efforts underway involving most of the SRFSI partners in different research and development initiatives in the region, and both the scientists from the International Agricultural Research Centers (IARCs) and the Australian partners have considerable experience and networks in South Asia and specifically in the EGP. The SRFSI project will therefore be able to start activities and develop working groups with a minimum of effort and time spent in team development.

Brief summaries of the particular strengths of the different partner organizations involved in SRFSI are as follows:

**CIMMYT** has a long history working with national partners in the Indo-Gangetic Plains, and an almost equally long history of working with participatory adaptation of conservation agriculture technologies and techniques for smallholder farming systems. CIMMYT brings experience on CA from many different parts of the world, as well as considerable experience in farming systems research and participatory on-farm adaptive research. CIMMYT manages the Cereal Systems Initiative for South Asia (CSISA) which is a similar and very complementary project to SRFSI. CIMMYT leads many networks and has an enviable reputation as an ‘honest broker’ and delivering ‘value for money’. These factors give CIMMYT a clear advantage in coordinating the SRFSI project.

***Australia***

**CSIRO** scientists are leaders in the field of decision sciences, and integrating socio-economic (livelihoods, institutional analysis) and biophysical sciences (agronomy and systems model development). CSIRO scientists have been at the forefront of the development of the APSIM group of farming system simulation models, integrating rice into APSIM and in the training of developing country scientists in the use of these models, including this activity in the ACIAR-funded project with the South Asian Association for Regional Cooperation (SAARC). CSIRO is a member of Australian Aid’s Sustainable Development Investment Strategy (SDIP) for South Asia. All the scientists involved in the CSIRO team involved in the project have extensive experience in developing countries, especially in South Asia.

**Australian Universities** have a wealth of expertise in diverse fields. The project will tap into this expertise with short term consultancies to support capacity building, research and project management. Although most of the input from Australian Universities will be defined by priority-setting with project partners at the initial planning meeting, three Australian Universities will be part of the project from the outset, given the particular skills and experience of their staff which will add important dimensions to the project.

The staff from **Curtin University**, Western Australia, who will support the project have considerable experience on farmer decision-making processes and responses to risk, agribusiness value chains and the formation and interactions with collaborative farmer groups.

The **University of Queensland** has exceptional capacity in studies and understanding of soil quality and soil degradation. The team from UQ also has experience with crop/soil simulation modelling and will be able to provide support in linking soil quality studies with longer-term effects through simulation models. No additional funding from variation 3 will go directly UoQ after June 2018.

***Bangladesh***

The **Bangladesh Agricultural Research Council (BARC)** is the apex body for agricultural research in Bangladesh under the Ministry of Agriculture. Ten agricultural research institutes are the constituent units of BARC, including the **Bangladesh Agricultural Research Institute (BARI)** which will be the principal research partner of the SRFSI project in Bangladesh. BARI is mandated to carry out research on a wide variety of crops including wheat, pulses, oilseeds and horticultural crops. The major areas of research include soil and water management, crop management and the development of farm machinery (as shown for example in the ACIAR Rice-Maize Project). BARI also has a strong Training and Communications branch.

The **Department of Agricultural Extension (DAE)** of the Ministry of Agriculture of Bangladesh is charged with agricultural extension efforts across the country. DAEs mission is to provide efficient and effective needs based extension services to all categories of farmer, to enable them to optimize their use of resources, in order to promote sustainable agricultural and socio-economic development.

The national NGO Rangpur-Dinajpur Rural Services (**RDRS**) is linked to international NGOs and works with the rural poor, the landless and marginal farmers to achieve sustainable increases in their living standards. With this aim, RDRS enables those who participate in its programme to gain the necessary skills, understanding, confidence, institutions and services; and ensure that the rural communities have the necessary economic, social and environmental resources**. RDRS is well-placed to lead project activities in Rangpur.**

***Nepal***

The Nepal Agricultural Research Council (**NARC**) is an autonomous organization charged with agricultural research in the country and in helping raise the economic level of the population. NARC has research stations in all of the major agro-ecological zones of the country, including in the eastern Terai region where the SRFSI project will be active. The principal research areas of NARC include cereals and cash crops (especially rice, maize and wheat), soil and irrigation management, farming systems, agricultural extension, agricultural economics and marketing, agro-ecology and the environment and social sciences.

The **Department of Agriculture** of the Ministry of Agricultural Development of Nepal bears the overall responsibility for the agricultural growth and development of agriculture in the country. The broad objective of the DOA is to support and help achieve food security and poverty alleviation the extension of agricultural technologies and value chain adjustments that lead to the transformation of agriculture through diversification and commercialization. The DoA is therefore the ideal partner for the out-scaling activities of SRFSI in Nepal.

The national NGO FORWARD-Nepal is linked to international NGOs and works with the rural poor and marginal farmers to achieve sustainable increase in their living standards. Working in Terai of Nepal including eastern-Terai where SRFSI activities are implemented. It ensures that the rural communities have the access of new technologies that are adapted in in their bio-physical and socio-economic circumstances. FORWARD **is well-placed to lead project activities in the eastern Terai of Nepal.**

***India***

**ICAR**, the Indian Council for Agricultural Research is the apex body for coordinating, guiding and managing research and education in agriculture in the entire country of India. ICAR’s Research Complex for the Eastern Region (ICAR-RCER) Patna, has the mandate to address agricultural production in the eastern states of India, including Bihar and West Bengal. The institute undertakes research work in, among others, the areas of land and water resources management, crop production, horticulture and socio-economic aspects for agricultural development in the region so as to improve the livelihood of resource poor farmers.

The mandate of **Bihar Agricultural University (BAU)**, Sabour, includes strategic and applied research for development of agricultural technology, the extension education programme in the State of Bihar, by planning and organising different programmes of human resource capability in agriculture and related domains, and collaboration with relevant national and international agencies for all round development of agriculture in the State of Bihar. As such the BAU is well placed to support both research and extension (out-scaling) activities in the Purnea District of Bihar.

The mandate of the Uttar Banga Krishi Viswavidyalaya (the North Bengal Agricultural University – **UBKV**) includes research on agricultural production systems and undertaking the extension education programme in the field of agriculture to the rural people of West Bengal. The UBKV has regional research stations and sub-stations spread over three agro-climatic regions in North Bengal and has major research thrusts in, among other topics, crop production, resource conservation, water management, conservation agriculture and social sciences.

**JEEViKA** – the Bihar Rural Livelihoods Project is implemented by the Bihar Rural Livelihoods Promotion Society (BRLPS), an independent society set up by the Government of Bihar and supported by the World Bank. JEEViKA's objective is to enhance the social and economic empowerment of the rural poor in Bihar, especially through creating self-managed community institutions of participating households (self-help groups) and enhancing income through sustainable livelihoods and increasing access to social protection, including food security, by enabling the rural poor to articulate a more effective voice in the implementation of such schemes.

**Sakhi** Bihar is an organization that strives for the socio-economic empowerment of poor women and girl children of families living below the poverty line by improving their existing conditions through their organization into self-help groups. Sakhi has also had considerable experience in formation and promotion of SHGs of self employed women and enabling credit linkages for them. They will not get additional funding under variation 3.

***International***

International Development Enterprises (iDE) is an international non-profit organization working to increase income for poor rural households and create income opportunities for rural communities. iDE employs business principles, appropriate technologies, and agriculture science to facilitate market systems in which the rural poor can participate effectively, and has offices in Nepal, Bangladesh and India. iDE will lead the development of business hubs (commercial pockets) in the SRFSI communities to help organise and link farmers to markets while at the same time facilitating private sector linkages with farm business groups to provide inputs and services. iDE will also lead the business development content of the training courses for service providers and agro-dealers.

The International Food Policy Research Institute (IFPRI) has a team based in Delhi with a strong background in policy research in the region. IFPRI’s priorities include identifying and analysing alternative international, national, and local policies in support of improved food security and nutrition, contributing to capacity strengthening of people and institutions in developing countries actively engaging in policy communications and carrying out dialogues to link research and policy action. IFPRI has conducted, and continues to conduct, studies on agricultural policy in South Asia, including the eastern Gangetic Plains – the focal area of the SRFSI. Water policy and agricultural machinery policies are two areas of expertise of the IFPRI team, both of which are important areas for the SRFSI. No additional funding from variation 3 will go directly to IFPRI after June 2018.

### Summary details of the role of each participant involved

* TP Tiwari will be the Project Leader (PL). He has more than 25 years’ experience on participatory research and development in South Asia, including project coordination experience for initiatives such as CSISA-Bangladesh ($7.7 M USD to CIMMYT). With inputs from the Science Coordinator and Project Manager, Dr. Tiwari will manage strategy development and planning processes, partner relations, donor reporting, and provide high-level oversight of project activities towards agreed milestones across the three SRFSI countries.
* Mahesh Gathala will be the Science Coordinator. He has more than 14 years’ experience on CA-based crop management practices with a strong background in advanced agronomic production techniques in the region. Dr. Gathala will coordinate experimental design, agronomic field activities, and scientific synthesis with national and Australian partners across the three countries with PL inputs.
* Andy McDonald is a regional cropping systems agronomist and CIMMYT’s strategic team leader for sustainable intensification in South-Asia. He will provide support to the Project Leader on strategy development and implementation, and ensure robust linkages with CSISA and other CIMMYT projects in the region.
* The Project Manager, Ashraf Ali, will oversee the administrative management of the project and lead the project M&E.
* The M&L expert will ensure the implementation of the activities added under Variation 3 focussing on quality implementation of capacity development efforts
* Apurba K. Chowdhury is a plant pathologist with UBKV, and has a wide appreciation of agricultural production in West Bengal. He has considerable experience with CA-based technologies, both on-station and on-farm, in collaboration with various international organizations. He will oversee the project activities in West Bengal in coordination with the Director of Agriculture and will be involved in the on-farm research in the state.
* Kalyan Kanti Das (UBKV) will lead the socio-economic activities in both districts of West Bengal. Dr. Das has wide experience in socio-economic studies including production economics, natural resource management and time series analysis. He has also mentored and taught numerous postgraduate students.
* Tapamay Dhar (UBKV) will be in charge of the on-farm research (OFR) efforts in Malda. He is in charge of the Malda university KVK, has more than 13 years’ experience in CA-based crop management, as well as on insect-pest dynamics and their control through IPM.
* Prateek Madhab Bhattacharya is a plant pathologist with UBKV and has wide experience on disease diagnostics and also practical experience with agronomic techniques and on-farm participatory research trials. He has managed several CA projects from ICAR and other donors. He will support the OFR in West Bengal, especially with respect to integrated disease management.
* B.P. Bhatt is director of RCER-ICAR complex, Patna. He will oversee the CD component of ICAR. He has successfully completed many research projects, both funded by the Government of India and external donors, and has many publications on farming systems and agroforestry.
* Haris will manage the OFR efforts of the project. He is a hands-on agronomist, with experience in crop production and water management, farming systems for waterlogged areas, and crop modelling studies in changing climate scenarios. He led a team that developed a very good Low Water Energy System (LEWA).
* K.M. Singh will provide orientation to the project for socioeconomic work in India in general. He has more than 28 years’ experience in the areas of crop and livestock economics, impact assessment studies, participatory technology development, building social capital and group approaches towards technology dissemination, extension reforms, market-led and demand-driven extension, capacity building, and value chain studies. He also has 22 years of teaching experience as a faculty member of R.A.U., Bihar
* Manoj Kumar, will oversee JEEViKA’s activities in both districts of Bihar. Mr. Kumar has been involved in developing innovation systems focusing on farmers’ problems and has implemented several livelihood projects.
* Govind Kumar Rai will lead the development activities of JEEViKA in Purnea. He has an agricultural education as well as a management background, both of which will be helpful in developing livelihoods activities in rural areas. He has a good understanding of the rural systems in Bihar.
* Prem Prakash Bharati will be responsible for development activities in one community in Purnea. Currently, he is working in JEEViKA’s agricultural awareness campaign including the supply chain of inputs and produce, and market linkages at the community level. Professionally, he has a management background.
* Paritosh Bhattacharyya Director – DoA West Bengal, will oversee the development activities in coordination with UBKV in both Malda and Coochbehar and other districts. Director of Agriculture, West Bengal, will help define priorities for research and extension in the State as well as overseeing the out-scaling efforts.
* Department of Agriculture staff in West Bengal will conduct the extension and development activities in four communities in West Bengal. The District Agricultural Officers in Coochbehar and Malda will provide institutional coordination and logistical support, Block Agricultural Officers will provide technical oversight and coordination and Subject Matter Specialists/Agricultural Coordinators in each block will conduct the field work and have direct contact with Field Technicians in the project communities.
* Renuka Shrestha will lead the on-farm research efforts of NARC in both districts in Nepal, supported by Shreemat Shrestha. She is senior agronomist with more than 20 years’ experience in agronomic production technologies, including conservation agriculture, in different ecologies in Nepal.
* Agri. Engineer from NARC, will oversee the mechanisation and machinery evaluation and modification activities in Nepal. An Agricultural Engineer with more than 20 years of professional experience in research and development of agricultural engineering and the development of appropriate technologies that contribute to enhancing food and nutrition security and commercialization in Nepal.
* Umesh Acharya will provide oversight and logistical support to all activities in the Sunsari district.
* DDG DG DoA, Nepal will be the contact person of the project in the Department of Agriculture (DoA), Nepal, and will oversee the work of the Department with SRFSI. The Deputy Director General is the focal point for planning and monitoring the agricultural extension program in Nepal.
* Point of Contact (PoC) from DoA-Nepal will oversee the work of the DoA in both districts in Nepal and will be involved in the socio-economic studies of the project.
* Suresh Prasad Gautam will be the DoA contact person for the project in the Eastern Region of Nepal and will provide regional coordination and support for the development efforts. Mr. Suresh is responsible for DoA agricultural extension activities in the Eastern Region.
* DADO will be responsible for the DoA activities in Dhanusa. He has long experience with on-farm demonstration and technology transfer in the Nepal Terai.
* DADO will be responsible for the DoA activities in Sunsari. S/he has responsibilities for agriculture technology dissemination and overall agriculture development in the district.
* Abul Kalam Azad will be the official contact person of the project in Bangladesh. As DG of BARI he will guide project interventions in the country, and will help identify new partners for the project.
* Ilias Hossain will provide OFR oversight in both Rajshahi and Rangpur and will be involved in the agronomic research, equipment development and training. Dr. Hossain is a leading agricultural engineer with more than 20 years’ experience in the design and development of equipment for 2-wheel tractors in Bangladesh.
* Akbar Hossain will manage the on-farm research trials in Rangpur in coordination with RDRS. He is a practical agronomist with considerable experience with both on-station and on-farm research.
* Scientist from RWRC, Rajshahi will manage the on-farm trial programme in Rajshahi. He has strength in farmer participatory research execution.
* ASM Mahbubur Rahman Khan, head of the On-Farm Research Division of BARI, will oversee BARI on-farm efforts in Bangladesh. Under the On-Farm Research Division BARI executes on-farm research for the participatory development of new technologies.
* An OFRD scientist will conduct the out-scaling activities of BARI in the Barind Tract of Rajshahi. He has carried out research planning, design and implementation of field experiments in relation to crop management, crop physiology, agroforestry and integrated farming systems in the Barind area (AEZ 26) under the On-Farm Research Division (OFRD) of BARI since 1997
* Mazharul Anwar will conduct the out-scaling activities of BARI in Rangpur. He has conducted farming systems, soil fertility, integrated crop management and socio economic research on wheat, maize, potatoes, pulses, oilseeds, horticulture and spice crops, with experience in the supervision of field experiments, data analysis, report writing, and presenting the findings in regional review workshops conducted by the OFRD.
* The Deputy Directors of DAE in both Rajshahi and Rangpur will provide overall coordination and logistical support for SRFSI in the communities managed by DAE. A District Training Officer will help plan and oversee the work in each district, which will be conducted by Upzila Agricultural Officers in each community through Sub-Assistant Agricultural Officers.
* Mamunur Rashid will coordinate the RDRS work in Rangpur including both the OFR and development activities which will be managed directly by a Project Development Officer and a Research Associate to be employed through the SRFSI project.
* Peter Brown will be the CSIRO Team Leader. He will work closely with the CSIRO social science team to assist with bridging the gap between the biophysical and modelling components and will be especially involved in decision and trade-off analysis (Activity 2.2.4 and 3.1) and the development of innovation platforms (Activity 3.2).
* Alison Laing will be involved in validating and adjusting APSIM, and in training on the use of the model to analyse scenarios and be involved in Outscaling Activities. She will spend blocks of time in region working closely with partners.
* Fay Rola-Rubzen will lead work on understanding farmer decision-making processes and responses to risk, and will collaborate in the project efforts on agribusiness value chain analysis, socio-economic analysis and collaborative farmer groups as well as mentoring of young scientists in the EGP.
* Ram Dalal will support project work on water-use efficiency and related nutrient dynamics, as well as on soil carbon and soil quality and mentor young scientists in these areas. Variation changes were communicated formally in October 2015.
* Avinash Kishore, IFPRI Scientist will lead the SRFSI policy work in the region. His areas of research include technology policy, market, and institutional economics.

### 5.3.4 Implementation of the Variation 4

Variation 4 will be used to transition from technological proficiency and capacity development to exploring how to create momentum. Current active partners (22) will be reduced to between 4 and 6 strategic partners, who will be selected after a comprehensive assessment of performance during variation 3. This reflects a more limited budget as well as the changing nature of activities to be implemented. The original budget for partners will be maintained (i.e. the remaining collaboration budget as per the Variation 3 proposal of 127,803AUD will be directly repurposed for strategic sub grants. This leaves the residual CIMMYT held funds of 590,671 AUD for CIMMYT implemented activities.

The Small Research Activities commissioned during the same time period will complement the activities of this Variation 4: Soil fertility SRA by University of Queensland, Weeds dynamic SRA by CIMMYT, Yield gaps SRA by CSIRO.

## Intellectual property and other regulatory compliance

It is envisaged that the products from this project will be publicly available. All data generated in the project will be shared among all project partners.

The Agricultural Production System Simulator Model (APSIM) managed by the APSIM Initiative (AI), whose foundation members are CSIRO, the State of Queensland and the University of Queensland, is available free of charge for non-commercial use to those who agree to licensing terms set by the AI. The licensing allows access and modifications to the source code of APSIM as long as such modifications are submitted to the AI and are evaluated by a panel set up by AI before inclusion of proposed modifications into an official APIM release.

CSIRO as a project partner will be actively engaged in using, adapting and developing the APSIM models using the data, information and interactive activities generated by other project collaborators/partners in SRFSI. In this regard, it is expected that any improvements to the model would be directly vetted by CSIRO and incorporated into APSIM for future release and free of charge access as per the licensing terms of AI. Further, if any new modules to APSIM were developed in the course of the SRFSI project, such modules will become the property of AI and its future access will be as already described. AI stipulates that in case an organization developing new modules to APSIM wanted to claim ownership on such modules it should negotiate an ownership arrangement with AI. Given the described terms of access and use, it is expected that the use of APSIM in this project are agreeable and favourable to the development of project and will not limit its operations. More information on the guiding principles and the processes for incorporation of improvements can be found in the website of the APSIM Initiative at http://www.apsim.info/AboutUs.aspx.

Prototype and established CA machinery and irrigation pumps (and associated irrigation equipment) developed by other projects and equipment manufacturers will undergo evaluation and testing in the SRFSI project with the participation of farmers, project partners, machinery manufacturers and other interested parties. Any participant may use the information gained and shared in these evaluations to carry out modifications to existing models or develop new equipment models without restriction by the SRFSI project partners. Equipment developers who use this information will be responsible for their own IP registration and for clarifying IP issues that exist with the equipment on which their prototypes and new equipment are based.

Based on the above, there do not seem to be background IP issues that will limit project operations.

## Travel table

#### PART A Commissioned Organisation or IARC

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Trip no.** | **Person or position** | **Estimated date of travel** | **From / to** | **Purpose** | **Duration (days)** |
| CIM1 | CIMMYT Social scientist | May-14 | DAC-KTM | Inception Workshop | 7 |
| CIM2 | Mahesh Gathala | May-14 | DAC-KTM | Inception Workshop | 7 |
| CIM3 | Ashraf Ali | May-14 | DAC-KTM | Inception Workshop | 7 |
| CIM4 | Mahesh Gathala | May-14 | DAC-PAT | Bihar Summer Planning Meeting | 5 |
| CIM5 | Mahesh Gathala | May-14 | DAC-IXB | West Bengal Summer Planning Meeting | 5 |
| CIM6 | Mahesh Gathala | May-14 | DAC-BIR | Nepal Summer Planning Meeting | 5 |
| CIM7 | Mahesh Gathala | May-14 | DAC-IXB | Training course | 12 |
| CIM8 | Ashraf Ali | May-14 | DAC-PAT | Bihar Summer Planning Meeting | 5 |
| CIM9 | Ashraf Ali | May-14 | DAC-IXB | West Bengal Summer Planning Meeting | 5 |
| CIM10 | Ashraf Ali | May-14 | DAC-BIR | Nepal Summer Planning Meeting | 5 |
| CIM11 | Mahesh Gathala | Jun-14 | DAC-PAT | Training Course | 10 |
| CIM12 | Mahesh Gathala | Jul-14 | DAC-IXB | Scenario Building Workshop | 6 |
| CIM13 | CIMMYT Social scientist | Aug-14 | DAC-PAT | Bihar Summer Study Tour | 5 |
| CIM14 | CIMMYT Social scientist | Aug-14 | DAC-DAC | Bangladesh Summer Study Tour | 5 |
| CIM15 | Mahesh Gathala | Aug-14 | DAC-PAT | Bihar Summer Study Tour | 5 |
| CIM16 | Mahesh Gathala | Aug-14 | DAC-IXB | West Bengal Summer Study Tour | 5 |
| CIM17 | Mahesh Gathala | Aug-14 | DAC-BIR | Nepal Summer Study Tour | 5 |
| CIM18 | Ashraf Ali | Aug-14 | DAC-PAT | Bihar Summer Study Tour | 5 |
| CIM19 | Ashraf Ali | Aug-14 | DAC-IXB | West Bengal Summer Study Tour | 5 |
| CIM20 | Ashraf Ali | Aug-14 | DAC-BIR | Nepal Summer Study Tour | 5 |
| CIM21 | CIMMYT Social scientist | Aug-14 | DAC-PAT-IXB | Training course | 15 |
| CIM22 | CIMMYT Social scientist | Aug-14 | DAC-BIR | Training course | 8 |
| CIM23 | Mahesh Gathala | Sep-14 | DAC-PAT | Bihar Winter Planning Meeting | 5 |
| CIM24 | Mahesh Gathala | Sep-14 | DAC-IXB | West Bengal Winter Planning Meeting | 5 |
| CIM25 | Mahesh Gathala | Sep-14 | DAC-BIR | Nepal Winter Planning Meeting | 5 |
| CIM26 | Ashraf Ali | Sep-14 | DAC-PAT | Bihar Winter Planning Meeting | 5 |
| CIM27 | Ashraf Ali | Sep-14 | DAC-IXB | West Bengal Winter Planning Meeting | 5 |
| CIM28 | Ashraf Ali | Sep-14 | DAC-BIR | Nepal Winter Planning Meeting | 5 |
| CIM29 | Ashraf Ali | Sep-14 | DAC-KTM | Revision office mgmt and procedures | 4 |
| CIM30 | Ashraf Ali | Sep-14 | DAC-PAT | Revision office mgmt and procedures | 4 |
| CIM31 | Ashraf Ali | Sep-14 | DAC-IXB | Revision office mgmt and procedures | 4 |
| CIM32 | Andy McDonald | Oct-14 | KTM-PAT | 2014 Project Planning Meeting | 5 |
| CIM33 | CIMMYT Social scientist | Oct-14 | DAC-PAT | 2014 Project Planning Meeting | 5 |
| CIM34 | Mahesh Gathala | Oct-14 | DAC-PAT | 2014 Project Planning Meeting | 5 |
| CIM35 | Ashraf Ali | Oct-14 | DAC-PAT | 2014 Project Planning Meeting | 5 |
| CIM36 | Andy McDonald | Nov-14 | KTM-PAT | 2014 Steering Committee Meeting | 3 |
| CIM37 | CIMMYT Social scientist | Nov-14 | DAC-PAT | 2014 Steering Committee Meeting | 3 |

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| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
| **Trip no.** | **Person or position** | **Estimated date of travel** | **From / to** | **Purpose** | **Duration (days)** |
| CIM38 | Mahesh Gathala | Nov-14 | DAC-PAT | 2014 Steering Committee Meeting | 3 |
| CIM39 | Ashraf Ali | Nov-14 | DAC-PAT | 2014 Steering Committee Meeting | 3 |
| CIM40 | Mahesh Gathala | Nov-14 | DAC-USA | Professional Meeting | 6 |
| CIM41 | Mahesh Gathala | Dec-14 | DAC-MEX | CIMMYT Program Planning & Coordination Meetings | 8 |
| CIM42 | Ashraf Ali | Dec-14 | DAC-MEX | CIMMYT Program Planning & Coordination Meetings | 8 |
| CIM43 | CIMMYT Social scientist | Dec-14 | DAC-MEX | CIMMYT Program Planning & Coordination Meetings | 8 |
| CIM44 | CIMMYT Social scientist | Dec-14 | DAC-BIR | Farmer Meetings | 14 |
| CIM45 | CIMMYT Social scientist | Dec-14 | DAC-PAT | Farmer Meetings | 14 |
| CIM46 | Mahesh Gathala | Feb-15 | DAC-PAT | Bihar Winter Study Tour | 5 |
| CIM47 | Mahesh Gathala | Feb-15 | DAC-IXB | West Bengal Winter Study Tour | 5 |
| CIM48 | Mahesh Gathala | Feb-15 | DAC-BIR | Nepal Winter Study Tour | 5 |
| CIM49 | Ashraf Ali | Feb-15 | DAC-PAT | Bihar Winter Study Tour | 5 |
| CIM50 | Ashraf Ali | Feb-15 | DAC-IXB | West Bengal Winter Study Tour | 5 |
| CIM51 | Ashraf Ali | Feb-15 | DAC-BIR | Nepal Winter Study Tour | 5 |
| CIM52 | Mahesh Gathala | Apr-15 | DAC-PAT | Bihar Summer Planning Meeting | 5 |
| CIM53 | Mahesh Gathala | Apr-15 | DAC-IXB | West Bengal Summer Planning Meeting | 5 |
| CIM54 | Mahesh Gathala | Apr-15 | DAC-BIR | Nepal Summer Planning Meeting | 5 |
| CIM55 | Ashraf Ali | Apr-15 | DAC-PAT | Bihar Summer Planning Meeting | 5 |
| CIM56 | Ashraf Ali | Apr-15 | DAC-IXB | West Bengal Summer Planning Meeting | 5 |
| CIM57 | Ashraf Ali | Apr-15 | DAC-BIR | Nepal Summer Planning Meeting | 5 |
| CIM58 | Mahesh Gathala | Jun-15 | DAC-PAT | Training Course | 7 |
| CIM59 | Mahesh Gathala | Aug-15 | DAC-PAT | Bihar Summer Study Tour | 5 |
| CIM60 | Mahesh Gathala | Aug-15 | DAC-IXB | West Bengal Summer Study Tour | 5 |
| CIM61 | Mahesh Gathala | Aug-15 | DAC-BIR | Nepal Summer Study Tour | 5 |
| CIM62 | TP Tiwari | Sep-15 | DEL-PAT | Bihar Winter Planning Meeting | 5 |
| CIM63 | TP Tiwari | Sep-15 | DEL-DAC | Bangladesh Winter Planning Meeting | 5 |
| CIM64 | Mahesh Gathala | Sep-15 | DAC-CBR | Professional meetings & visit to partners in Australia | 14 |
| CIM65 | Mahesh Gathala | Sep-15 | DAC-PAT | Bihar Winter Planning Meeting | 5 |
| CIM66 | Mahesh Gathala | Sep-15 | DAC-IXB | West Bengal Winter Planning Meeting | 5 |
| CIM67 | Mahesh Gathala | Sep-15 | DAC-BIR | Nepal Winter Planning Meeting | 5 |
| CIM68 | Ashraf Ali | Sep-15 | DAC-PAT | Bihar Winter Planning Meeting | 5 |
| CIM69 | Ashraf Ali | Sep-15 | DAC-IXB | West Bengal Winter Planning Meeting | 5 |
| CIM70 | Ashraf Ali | Sep-15 | DAC-BIR | Nepal Winter Planning Meeting | 5 |
| CIM71 | Ashraf Ali | Sep-15 | DAC-KTM | Revision office mgmt and procedures | 4 |
| CIM72 | Ashraf Ali | Sep-15 | DAC-PAT | Revision office mgmt and procedures | 4 |
| CIM73 | Ashraf Ali | Sep-15 | DAC-IXB | Revision office mgmt and procedures | 4 |
| CIM74 | TP Tiwari | Oct-15 | KTM-DAC | 2015 Project Planning Meeting | 5 |
| CIM75 | Mahesh Gathala | Oct-15 | KTM-DAC | 2015 Project Planning Meeting | 5 |
| CIM76 | Ashraf Ali | Oct-15 | KTM-DAC | 2015 Project Planning Meeting | 5 |
| CIM77 | TP Tiwari | Nov-15 | KTM-DAC | 2015 Steering Committee Meeting | 5 |
| CIM78 | Andy McDonald | Nov-15 | KTM-DAC | 2015 Steering Committee Meeting | 3 |
| CIM79 | Mahesh Gathala | Nov-15 | KTM-DAC | 2015 Steering Committee Meeting | 3 |
| CIM80 | Ashraf Ali | Nov-15 | KTM-DAC | 2015 Steering Committee Meeting | 3 |
| CIM81 | Mahesh Gathala | Dec-15 | DAC-MEX | CIMMYT Program Planning & Coordination Meetings | 8 |
| CIM82 | Mahesh Gathala | Dec-15 | DAC-PAT-IXB | Follow-up & Training Courses | 10 |

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| --- | --- | --- | --- | --- | --- |
| **Trip no.** | **Person or position** | **Estimated date of travel** | **From / to** | **Purpose** | **Duration (days)** |
| CIM83 | Ashraf Ali | Dec-15 | DAC-MEX | CIMMYT Program Planning & Coordination Meetings | 8 |
| CIM84 | Mahesh Gathala | Feb-16 | DAC-PAT | Bihar Winter Study Tour | 5 |
| CIM85 | Mahesh Gathala | Feb-16 | DAC-IXB | West Bengal Winter Study Tour | 5 |
| CIM86 | Mahesh Gathala | Feb-16 | DAC-BIR | Nepal Winter Study Tour | 5 |
| CIM87 | Mahesh Gathala | Apr-16 | DAC-PAT | Bihar Summer Planning Meeting | 5 |
| CIM88 | Mahesh Gathala | Apr-16 | DAC-IXB | West Bengal Summer Planning Meeting | 5 |
| CIM89 | Mahesh Gathala | Apr-16 | DAC-BIR | Nepal Summer Planning Meeting | 5 |
| CIM90 | Ashraf Ali | Apr-16 | DAC-PAT | Bihar Summer Planning Meeting | 5 |
| CIM91 | Ashraf Ali | Apr-16 | DAC-IXB | West Bengal Summer Planning Meeting | 5 |
| CIM92 | Ashraf Ali | Apr-16 | DAC-DAC | Bangladesh Summer Planning Meeting | 5 |
| CIM93 | Ashraf Ali | Apr-16 | DAC-BIR | Nepal Summer Planning Meeting | 5 |
| CIM94 | Mahesh Gathala | Jun-16 | DAC-PAT | Training courses | 6 |
| CIM95 | Mahesh Gathala | Aug-16 | DAC-PAT | Bihar Summer Study Tour | 5 |
| CIM96 | Mahesh Gathala | Aug-16 | DAC-IXB | West Bengal Summer Study Tour | 5 |
| CIM97 | Mahesh Gathala | Aug-16 | DAC-BIR | Nepal Summer Study Tour | 5 |
| CIM98 | TP Tiwari | Sep-16 | DAC-PAT | Bihar Winter Planning Meeting | 5 |
| CIM99 | TP Tiwari | Sep-16 |  | Bangladesh Winter Planning Meeting | 5 |
| CIM100 | Mahesh Gathala | Sep-16 | DAC-PAT | Bihar Winter Planning Meeting | 5 |
| CIM101 | Mahesh Gathala | Sep-16 | DAC-IXB | West Bengal Winter Planning Meeting | 5 |
| CIM102 | Mahesh Gathala | Sep-16 | DAC-BIR | Nepal Winter Planning Meeting | 5 |
| CIM103 | Ashraf Ali | Sep-16 | DAC-PAT | Bihar Winter Planning Meeting | 5 |
| CIM104 | Ashraf Ali | Sep-16 | DAC-IXB | West Bengal Winter Planning Meeting | 5 |
| CIM105 | Ashraf Ali | Sep-16 | DAC-BIR | Nepal Winter Planning Meeting | 5 |
| CIM106 | Ashraf Ali | Sep-16 | DAC-KTM | Revision office mgmt and procedures | 5 |
| CIM107 | Ashraf Ali | Sep-16 | DAC-PAT | Revision office mgmt and procedures | 5 |
| CIM108 | Ashraf Ali | Sep-16 | DAC-IXB | Revision office mgmt and procedures | 5 |
| CIM109 | TP Tiwari | Oct-16 | KTM-PAT | 2016 Project Planning Meeting | 5 |
| CIM110 |  |  |  |  |  |
| CIM111 | Mahesh Gathala | Oct-16 | DAC-PAT | 2016 Project Planning Meeting | 5 |
| CIM112 | Ashraf Ali | Oct-16 | DAC-PAT | 2016 Project Planning Meeting | 5 |
| CIM113 | Mahesh Gathala | Nov-16 | DAC-USA | Professional meetings | 6 |
| CIM114 | Mahesh Gathala | Nov-16 | DAC-KTM | 2016 Steering Committee Meeting | 3 |
| CIM115 | TP Tiwari | Nov-16 | DAC-KTM | 2016 Steering Committee Meeting | 3 |
| CIM116 | Mahesh Gathala | Dec-16 | DAC-MEX | CIMMYT Program Planning & Coordination Meetings | 8 |
| CIM117 | TP Tiwari | Dec-16 | DAC-MEX | CIMMYT Program Planning & Coordination Meetings | 8 |
| CIM118 | Mahesh Gathala | Feb-17 | DAC-PAT | Bihar Winter Study Tour | 5 |
| CIM119 | Mahesh Gathala | Feb-17 | DAC-IXB | West Bengal Winter Study Tour | 5 |
| CIM120 | Mahesh Gathala | Feb-17 | DAC-BIR | Nepal Winter Study Tour | 5 |
| CIM121 | Mahesh Gathala | Apr-17 | DAC-PAT | Bihar Summer Planning Meeting | 5 |
| CIM122 | Mahesh Gathala | Apr-17 | DAC-IXB | West Bengal Summer Planning Meeting | 5 |
| CIM123 | Mahesh Gathala | Apr-17 | DAC-BIR | Nepal Summer Planning Meeting | 5 |
| CIM124 | Ashraf Ali | Apr-17 | DAC-PAT | Bihar Summer Planning Meeting | 5 |
| CIM125 | Ashraf Ali | Apr-17 | DAC-IXB | West Bengal Summer Planning Meeting | 5 |
| CIM126 | Ashraf Ali | Apr-17 | DAC-BIR | Nepal Summer Planning Meeting | 5 |
| CIM127 | Mahesh Gathala | Aug-17 | DAC-PAT | Bihar Summer Study Tour | 5 |
| CIM128 | Mahesh Gathala | Aug-17 | DAC-IXB | West Bengal Summer Study Tour | 5 |
| CIM129 | Mahesh Gathala | Aug-17 | DAC-BIR | Nepal Summer Study Tour | 5 |
| CIM130 | TP Tiwari | Sep-17 | DEL-PAT | Bihar Winter Planning Meeting | 5 |
| CIM131 |  | Sep-17 | DEL-DAC | Bangladesh Winter Planning Meeting | 5 |
| CIM132 | Mahesh Gathala | Sep-17 | DAC-PAT | Bihar Winter Planning Meeting | 5 |
| CIM133 | Mahesh Gathala | Sep-17 | DAC-IXB | West Bengal Winter Planning Meeting | 5 |
| CIM134 | Mahesh Gathala | Sep-17 | DAC-BIR | Nepal Winter Planning Meeting | 5 |
| CIM135 | Ashraf Ali | Sep-17 | DAC-PAT | Bihar Winter Planning Meeting | 5 |
| CIM136 | Ashraf Ali | Sep-17 | DAC-IXB | West Bengal Winter Planning Meeting | 5 |
| CIM137 | Ashraf Ali | Sep-17 | DAC-BIR | Nepal Winter Planning Meeting | 5 |
| CIM138 | Ashraf Ali | Sep-17 | DAC-KTM | Revision office mgmt and procedures | 54 |
| CIM139 | Ashraf Ali | Sep-17 | DAC-PAT | Revision office mgmt and procedures | 4 |
| CIM140 | Ashraf Ali | Sep-17 | DAC-IXB | Revision office mgmt and procedures | 4 |
| CIM141 | TP Tiwari | Oct-17 | DEL-KTM | 2017 Project Planning Meeting | 5 |
| CIM142 | Mahesh Gathala | Oct-17 | DAC-KTM | 2017 Project Planning Meeting | 5 |
| CIM143 | Ashraf Ali | Oct-17 | DAC-KTM | 2017 Project Planning Meeting | 5 |
| CIM144 | Andy McDonald | Nov-17 | KTM-IXB | 2017 Steering Committee Meeting | 3 |
| CIM145 | Mahesh Gathala | Nov-17 | DAC-IXB | 2017 Steering Committee Meeting | 3 |
| CIM146 | TP Tiwari | Nov-17 | DAC-IXB | 2017 Steering Committee Meeting | 3 |
| CIM147 | Mahesh Gathala | Dec-17 | DAC-MEX | CIMMYT Program Planning & Coordination Meetings | 8 |
| CIM148 | TP Tiwari | Dec-17 | DAC-MEX | CIMMYT Program Planning & Coordination Meetings | 8 |
| CIM149 | Mahesh Gathala | Feb-18 | DAC-PAT | Bihar Winter Study Tour | 5 |
| CIM150 | Mahesh Gathala | Feb-18 | DAC-IXB | West Bengal Winter Study Tour | 5 |
| CIM151 | Mahesh Gathala | Feb-18 | DAC-BIR | Nepal Winter Study Tour | 5 |
| CIM152 | Mahesh Gathala | Apr-18 | DAC-PAT | Bihar Summer Planning Meeting | 5 |
| CIM153 | Mahesh Gathala | Apr-18 | DAC-IXB | West Bengal Summer Planning Meeting | 5 |
| CIM154 | Mahesh Gathala | Apr-18 | DAC-BIR | Nepal Summer Planning Meeting | 5 |
| CIM155 | Ashraf Ali | Apr-18 | DAC-PAT | Bihar Summer Planning Meeting | 5 |
| CIM156 | Ashraf Ali | Apr-18 | DAC-IXB | West Bengal Summer Planning Meeting | 5 |
| CIM157 | Ashraf Ali | Apr-18 | DAC-BIR | Nepal Summer Planning Meeting | 5 |
| CIM158 | Andy McDonald | May-18 | KTM-DAC | 2018 Project Termination Meeting | 5 |
| CIM159 | Mahesh Gathala | May-18 | DEL-DAC | 2017 Project Termination Meeting | 5 |
| CIM160 | Ashraf Ali | May-18 | DEL-DAC | 2017 Project Termination Meeting | 5 |
| CIM161 | Ashraf Ali | May-18 | DAC-KTM | Revision office mgmt and procedures | 4 |
| CIM162 | Ashraf Ali | May-18 | DAC-PAT | Revision office mgmt and procedures | 4 |
| CIM163 | Ashraf Ali | May-18 | DAC-IXB | Revision office mgmt and procedures | 4 |

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| **Trip no.** | **Person or position** | **Estimated date of travel** | | | **From / to** | | **Purpose** | **Duration (days)** | | |
| CIM164 | TP Tiwari | Feb-16 | | | DAC-PAT | | Bihar Winter Study Tour | 5 | | |
| CIM165 | TP Tiwari | Feb-16 | | | DAC-IXB | | West Bengal Winter Study Tour | 5 | | |
| CIM166 | TP Tiwari | Feb-16 | | | DAC-BIR | | Nepal Winter Study Tour | 5 | | |
| CIM167 | TP Tiwari | Apr-16 | | | DAC-PAT | | Bihar Summer Planning Meeting | 5 | | |
| CIM168 | TP Tiwari | Apr-16 | | | DAC-IXB | | West Bengal Summer Planning Meeting | 5 | | |
| CIM169 | TP Tiwari | Apr-16 | | | DAC-BIR | | Nepal Summer Planning Meeting | 5 | | |
| CIM170 | TP Tiwari | Jun-16 | | | DAC-PAT | | Training courses | 6 | | |
| CIM171 | TP Tiwari | Aug-16 | | | DAC-PAT | | Bihar Summer Study Tour | 5 | | |
| CIM172 | TP Tiwari | Aug-16 | | | DAC-IXB | | West Bengal Summer Study Tour | 5 | | |
| CIM173 | TP Tiwari | Aug-16 | | | DAC-BIR | | Nepal Summer Study Tour | 5 | | |
| CIM174 | TP Tiwari | Sep-16 | | | DAC-PAT | | Bihar Winter Planning Meeting | 5 | | |
| CIM175 | TP Tiwari | Sep-16 | | |  | | Bangladesh Winter Planning Meeting | 5 | | |
| CIM176 | TP Tiwari | Sep-16 | | | DAC-PAT | | Bihar Winter Planning Meeting | 5 | | |
| CIM177 | TP Tiwari | Sep-16 | | | DAC-IXB | | West Bengal Winter Planning Meeting | 5 | | |
| CIM178 | TP Tiwari | Sep-16 | | | DAC-BIR | | Nepal Winter Planning Meeting | 5 | | |
| CIM179 | TP Tiwari | Oct-16 | | | DAC-PAT | | 2016 Project Planning Meeting | 5 | | |
| CIM180 | TP Tiwari | Nov-16 | | | DAC-KTM | | 2016 Steering Committee Meeting | 3 | | |
| CIM181 | TP Tiwari | Feb-17 | | | DAC-PAT | | Bihar Winter Study Tour | 5 | | |
| CIM182 | TP Tiwari | Feb-17 | | | DAC-IXB | | West Bengal Winter Study Tour | 5 | | |
| CIM183 | TP Tiwari | Feb-17 | | | DAC-BIR | | Nepal Winter Study Tour | 5 | | |
| CIM184 | TP Tiwari | Apr-17 | | | DAC-PAT | | Bihar Summer Planning Meeting | 5 | | |
| CIM185 | TP Tiwari | Apr-17 | | | DAC-IXB | | West Bengal Summer Planning Meeting | 5 | | |
| CIM186 | TP Tiwari | Apr-17 | | | DAC-BIR | | Nepal Summer Planning Meeting | 5 | | |
| CIM187 | TP Tiwari | Aug-17 | | | DAC-PAT | | Bihar Summer Study Tour | 5 | | |
| CIM188 | TP Tiwari | Aug-17 | | | DAC-IXB | | West Bengal Summer Study Tour | 5 | | |
| CIM189 | TP Tiwari | Aug-17 | | | DAC-BIR | | Nepal Summer Study Tour | 5 | | |
| CIM190 | TP Tiwari | Sep-17 | | | DAC-PAT | | Bihar Winter Planning Meeting | 5 | | |
| CIM191 | TP Tiwari | Sep-17 | | | DAC-IXB | | West Bengal Winter Planning Meeting | 5 | | |
| CIM192 | TP Tiwari | Sep-17 | | | DAC-BIR | | Nepal Winter Planning Meeting | 5 | | |
| CIM193 | TP Tiwari | Oct-17 | | | DAC-KTM | | 2017 ProjectPlanning Meeting | 5 | | |
| CIM194 | TP Tiwari | Feb-18 | | | DAC-PAT | | Bihar Winter Study Tour | 5 | | |
| CIM195 | TP Tiwari | Feb-18 | | | DAC-IXB | | West Bengal Winter Study Tour | 5 | | |
| CIM196 | TP Tiwari | Feb-18 | | | DAC-BIR | | Nepal Winter Study Tour | 5 | | |
| CIM197 | TP Tiwari | Apr-18 | | | DAC-PAT | | Bihar Summer Planning Meeting | 5 | | |
| CIM198 | TP Tiwari | Apr-18 | | | DAC-BIR | | Nepal Summer Planning Meeting | 5 | | |
| CIM199 | TP Tiwari | Apr-18 | | | DAC-PAT | | West Bengal Summer Planning Meeting |  | | |
| CIM200 | TP Tiwari | May-18 | | | DEL-DAC | | 2018 Project Termination Meeting | 5 | | |
| **Trip no.** | **Person or position** | | **Est. date of travel** | **From / to** | | **Purpose** | | | **Duration** |
| **(days)** |
| CIM201 | Consultant -scaling expert | | Sep/17 | MEX-DAC | | IP short course | | | 5 |
| CIM202 | Consultant -scaling expert | | Sep/17 | MEX-DAC | | ARPM and field visit | | | 5 |
| CIM203 | Research Associate | | Sep/17 | DEL-DAC | | ARPM and field visit | | | 10 |
| CIM204 | Consultant – Rabi+CapNeeds | | Sep/17 | INT+ DAC-local+ KTM | | ARPM, field visit, interviews with key stakeholders (note: contracted/funded by ACIAR directed) | | | 15 |
| CIM205 | Monitoring and Learning Expert (M&L) | | Oct/17 | TBD | | ToTs on CASI | | | 10 |
| CIM206 | Science Coordinator | | Oct/17 | TBD | | ToTs on CASI | | | 2 |
| CIM207 | Consultant – Rabi+CapNeeds | | Oct/17 | TBD | | ToTs on CASI  (note: contracted/funded by ACIAR directed) | | | 10 |
| CIM208 | Project leader | | Oct/17 | TBD | | ToTs on CASI | | | 2 |
| CIM209 | Monitoring and Learning Expert (M&L) | | Oct/17 | DAC-KTM | | Train CBF or enumerators | | | 10 |
| CIM210 | Science Coordinator | | Oct/17 | DAC-KTM | | Train CBF or enumerators | | | 2 |
| CIM211 | Project leader | | Oct/17 | DAC-KTM | | Train CBF or enumerators | | | 1 |
| CIM212 | Monitoring and Evaluation Consultant (M&E). | | Oct/17 | DAC-KTM | | Train CBF or enumerators | | | 10 |
| CIM213 | Monitoring and Learning Expert (M&L) | | Oct/17 | DAC-KTM-IXB/PAT | | Training modules | | | 10 |
| CIM214 | Science Coordinator | | Oct/17 | ,, | | Training module | | | 2 |
| CIM215 | Consultant -scaling expert | | Jan/18 | ,, | | Scaling assessment | | | 15 |
| CIM216 | Monitoring and Learning Expert (M&L) | | Oct/17 | ,, | | Train micro-entrepreneurs | | | 10 |
| CIM217 | Science Coordinator | | Oct/17 | ,, | | Train micro-entrepreneur | | | 1 |
| CIM218 | Monitoring and Evaluation Consultant (M&E). | | Oct/17 | ,, | | Train micro-entrepreneurs | | | 10 |
| CIM219 | Consultant -scaling expert | | Oct/17 | ,, | | Train micro-entrepreneurs | | | 2 |
| CIM220 | Project Manager | | Oct/17 | ,, | | Train micro-entrepreneurs | | | 1 |
| CIM221 | Project Agronomist | | Oct/17 | ,, | | Discussion meeting with partners on data management across locations | | | 15 |
| CIM222 | Monitoring and Learning Expert (M&L) | | Oct/17 | ,, | | Improve agro-dealers and market for.. | | | 5 |
| CIM223 | Science Coordinator | | Oct/17 | ,, | | Training to improve agro-dealers and market for.. | | | 2 |
| CIM224 | Consultant -scaling expert | | Oct/17 | ,, | | Improve agro-dealers and market for.. | | | 2 |
| CIM225 | Monitoring and Learning Expert (M&L) | | Oct/17 | ,, | | Business models for women | | | 5 |
| CIM226 | Consultant -scaling expert | | Nov/17 | ,, | | Business models for women | | | 2 |
| CIM227 | Monitoring and Evaluation Consultant (M&E). | | Nov/17 | ,, | | Business models for women | | | 5 |
| CIM228 | Research Associate | | Nov/17 | ,, | | Business models for women | | | 2 |
| CIM229 | Consultant -Comms | | Nov/17 | ,, | | Business models for women | | | 2 |
| CIM230 | Monitoring and Learning Expert (M&L) | | Nov/17 | DAC-KTM-DEL/IXB | | Train service providers | | | 10 |
| CIM231 | Science Coordinator | | Nov/17 | ,, | | Train service providers | | | 4 |
| CIM232 | Consultant -scaling expert | | Nov/17 | ,, | | Train service providers | | | 2 |
| CIM233 | Monitoring and Learning Expert (M&L) | | Nov/17 | ,, | | FGDs | | | 2 |
| CIM234 | Consultant -scaling expert | | Dec/17 | ,, | | FGDs | | | 2 |
| CIM235 | Monitoring and Evaluation Consultant (M&E). | | Dec/17 | ,, | | FGDs | | | 10 |
| CIM236 | Research Associate | | Dec/17 | ,, | | FGDs | | | 10 |
| CIM237 | Consultant-Comms | | Dec/17 | ,, | | FGDs | | | 5 |
| CIM238 | Monitoring and Evaluation Consultant (M&E). | | Dec/17 | ,, | | Field days | | | 10 |
| CIM239 | Consultant- Comms KMS | | Dec/17 | ,, | | Field days | | | 5 |
| CIM240 | Research Associate | | Dec/17 | ,, | | Field days | | | 4 |
| CIM241 | Monitoring and Learning Expert (M&L) | | Jan/18 | ,, | | Field days | | | 2 |
| CIM242 | Monitoring and Learning Expert (M&L) | | Jan/18 | DAC-KTM-IXB | | Training on seeds | | | 4 |
| CIM243 | Project Leader | | Jan/18 | ,, | | Training on seeds | | | 4 |
| CIM244 | Consultant-Comms KMS | | Feb/18 | ,, | | Seed linkage events | | | 2 |
| CIM245 | Project Leader | | Feb/18 | DAC-IXB/PAT | | Steering Committee Meeting/Project review | | | 3 |
| CIM246 | Science Coordinator | | Feb/18 | ,, | | Steering Committee Meeting/Project review | | | 3 |
| CIM247 | SIP Thematic Leader | | Feb/18 | ,, | | Steering Committee Meeting/Project review | | | 3 |
| CIM248 | Consultant-Comms KMS | | Feb/18 | ,, | | Steering Committee Meeting/Project review | | | 3 |
| CIM249 | Monitoring and Evaluation Consultant (M&E). | | Feb/18 | ,, | | Steering Committee Meeting/Project review | | | 3 |
| CIM250 | Monitoring and Evaluation Consultant (M&E). | | Feb/18 | DAC-KTM-DEL/IXB | | Winter crops monitoring | | | 10 |
| CIM251 | Project Leader | | Feb/18 | ,, | | Winter crops monitoring | | | 10 |
| CIM252 | Science Coordinator | | Feb/18 | ,, | | Winter crops monitoring | | | 10 |
| CIM253 | Consultant-Comms KMS | | Feb/18 | ,, | | Winter crops monitoring | | | 5 |
| CIM254 | Monitoring and Learning Expert (M&L) | | Feb/18 | ,, | | Winter crops monitoring | | | 5 |
| CIM255 | Research Associate | | Feb/18 | ,, | | Winter crops monitoring | | | 10 |
| CIM256 | Project Agronomist | | Oct/17 | ,, | | Discussion meeting with partners on data across locations | | | 15 |
| CIM257 | Monitoring and Evaluation Consultant (M&E). | | Feb/18 | ,, | | CASI adoption | | | 15 |
| CIM258 | Monitoring and Evaluation Consultant (M&E). | | Jun/18 | ,, | | CASI adoption and inputs to report on SFRSI-1 | | | 15 |
| CIM259 | Project Leader | | Jun/18 | DAC-KTM | | Meeting: Conclusion activities SFRSI-1/ way forward | | | 5 |
| CIM260 | Science Coordinator | | Jun/18 | DAC-KTM | | Meeting: Conclusion activities SFRSI-1/ way forward | | | 5 |
| CIM261 | Project Manager | | Jun/18 | DAC-KTM | | Meeting: Conclusion activities SFRSI-1/ way forward | | | 5 |
| CIM262 | Consultant-Scaling expert | | Jun/18 | DAC-KTM | | Meeting: Conclusion activities SFRSI-1/ way forward | | | 5 |
| CIM263 | Project Leader | | Sep/18 | DAC-KTM | | ARPM and field visit | | | 5 |
| CIM264 | Science Coordinator | | Sep/18 | DAC-KTM | | ARPM and field visit | | | 5 |
| CIM265 | Consultant -scaling expert | | Sep/18 | DAC-KTM | | ARPM and field visit | | | 5 |
| CIM266 | Research Associate | | Sep/18 | DEL-KTM | | ARPM and field visit | | | 5 |
| CIM267 | Capacity Dev Coordinator | | Sep/18 | DAC-KTM | | ARPM and field visit | | | 5 |
| CIM268 | Consultant – Comms, KMS | | Sep/18 | DAC-KTM | | ARPM and field visit | | | 5 |
| CIM269 | Project Manager | | Sep/18 | DAC-KTM | | ARPM and field visit | | | 5 |
| CIM270 | Project Agronomist | | Sep/18 | DAC-KTM | | ARMP and Field visit | | | 5 |
| CIM271 | Monitoring and Learning Expert (M&L) | | Oct/18 | DAC-KTM-DEL/IXB | | ToTs on CASI | | | 5 |
| CIM272 | Science Coordinator | | Oct/18 | DAC-KTM-DEL/IXB | | ToTs on CASI | | | 5 |
| CIM273 | Monitoring and Evaluation Consultant (M&E). | | Oct/18 | ,, | | ToTs on CASI | | | 2 |
| CIM274 | Project leader | | Oct/18 | ,, | | ToTs on CASI | | | 2 |
| CIM275 | Monitoring and Learning Expert (M&L) | | Oct/18 | DAC-KTM-DEL/IXB | | Train CBF or enumerators | | | 5 |
| CIM276 | Science Coordinator | | Oct/18 | ,, | | Train CBF or enumerators | | | 1 |
| CIM277 | Project leader | | Oct/18 | ,, | | Train CBF or enumerators | | | 1 |
| CIM278 | Monitoring and Evaluation Consultant (M&E). | | Oct/18 | ,, | | Train CBF or enumerators | | | 4 |
| CIM279 | Monitoring and Learning Expert (M&L) | | Oct/18 | ,, | | Training modules | | | 5 |
| CIM280 | Science Coordinator | | Oct/18 | ,, | | Training module | | | 1 |
| CIM281 | Consultant -scaling expert | | Oct/18 | ,, | | Training module | | | 4 |
| CIM282 | Monitoring and Learning Expert (M&L) | | Oct/18 | ,, | | Train micro-entrepreneurs | | | 5 |
| CIM283 | Science Coordinator | | Oct/18 | ,, | | Train micro-entrepreneurs | | | 2 |
| CIM284 | Consultant -scaling expert | | Oct/18 | ,, | | Train micro-entrepreneurs | | | 5 |
| CIM285 | Project Manager | | Oct/18 | ,, | | Train micro-entrepreneurs | | | 2 |
| CIM286 | Project Agronomist | | Oct/18 | ,, | | Discussion meeting with partners on data across locations | | | 10 |
| CIM287 | Monitoring and Learning Expert (M&L) | | Oct/18 | ,, | | Improve agro-dealers and market for.. | | | 5 |
| CIM288 | Science Coordinator | | Oct/18 |  | | Training to improve agro-dealers and market for.. | | | 2 |
| CIM289 | Consultant -scaling expert | | Oct/18 | ,, | | Improve agro-dealers and market for.. | | | 5 |
| CIM290 | Monitoring and Learning Expert (M&L) | | Oct/18 | ,, | | Business models for women | | | 10 |
| CIM291 | Consultant -scaling expert | | Nov/18 | ,, | | Business models for women | | | 2 |
| CIM292 | Monitoring and Evaluation Consultant (M&E). | | Nov/18 | ,, | | Business models for women | | | 4 |
| CIM293 | Research Associate | | Nov/18 | ,, | | Business models for women | | | 4 |
| CIM294 | Consultant -Comms | | Nov/18 | ,, | | Business models for women | | | 4 |
| CIM295 | Monitoring and Learning Expert (M&L) | | Nov/18 | ,, | | Train service providers | | | 10 |
| CIM296 | Science Coordinator | | Nov/18 | ,, | | Train service providers | | | 4 |
| CIM297 | Consultant -scaling expert | | Nov/18 | ,, | | Train service providers | | | 4 |
| CIM298 | Project Leader | | Nov/18 | DAC-MEX | | CIMMYT Program Planning & Coordination Meetings | | | 8 |
| CIM299 | Science Coordinator | | Nov/18 | DAC-MEX | | CIMMYT Program Planning & Coordination Meetings | | | 8 |
| CIM300 | Monitoring and Learning Expert (M&L) | | Nov/18 | DAC-KTM-DEL/PAT/IXB | | FGDs | | | 1 |
| CIM301 | Consultant -scaling expert | | Dec/18 | ,, | | FGDs | | | 1 |
| CIM302 | Monitoring and Evaluation Consultant (M&E). | | Dec/18 | ,, | | FGDs | | | 5 |
| CIM303 | Research Associate | | Dec/18 | ,, | | FGDs | | | 5 |
| CIM304 | Consultant-Comms, KMS | | Dec/18 | ,, | | FGDs | | | 5 |
| CIM305 | Monitoring and Evaluation Consultant (M&E). | | Dec/18 | ,, | | Field days | | | 5 |
| CIM306 | Consultant- Comms KMS | | Dec/18 | ,, | | Field days | | | 5 |
| CIM307 | Research Associate | | Dec/18 | ,, | | Field days | | | 5 |
| CIM308 | Monitoring and Learning Expert (M&L) | | Jan/19 | ,, | | Training on seeds | | | 5 |
| CIM309 | Project Leader | | Jan/19 | ,, | | Training on seeds | | | 4 |
| CIM310 | Consultant-Comms KMS | | Feb/19 | ,, | | Seed linkage events | | | 2 |
| CIM311 | Project Leader | | Feb/19 | DAC-IXB/KTM | | Steering Committee Meeting | | | 3 |
| CIM312 | Science Coordinator | | Feb/19 | DAC-IXB/KTM | | Steering Committee Meeting | | | 3 |
| CIM313 | SIP Thematic Leader | | Feb/19 | ,, | | Steering Committee Meeting | | | 3 |
| CIM314 | Consultant-Comms KMS | | Feb/19 | ,, | | Steering Committee Meeting | | | 3 |
| CIM315 | Monitoring and Evaluation Consultant (M&E). | | Feb/19 | DAC-KTM-DEL/PAT/IXB | | Winter crops monitoring | | | 9 |
| CIM316 | Project Leader | | Feb/19 | ,, | | Winter crops monitoring | | | 10 |
| CIM317 | Science Coordinator | | Feb/19 | ,, | | Winter crops monitoring | | | 10 |
| CIM318 | Consultant-Comms KMS | | Feb/19 | ,, | | Winter crops monitoring | | | 4 |
| CIM319 | Monitoring and Learning Expert (M&L) | | Feb/19 | ,, | | Winter crops monitoring | | | 4 |
| CIM320 | Research Associate | | Feb/19 | ,, | | Winter crops monitoring | | | 10 |
| CIM321 | Monitoring and Evaluation Consultant (M&E). | | Feb/19 | ,, | | Winter crops monitoring | | | 4 |
| CIM322 | Project Leader | | Mar/19 | DAC-MEX | | CIMMYT Program Planning & Coordination Meetings (Mex) | | | 8 |
| CIM323 | Science Coordinator | | Mar/19 | DAC-MEX | | CIMMYT Program Planning & Coordination Meetings (Mex) | | | 8 |
| CIM324 | Project Leader | | Apr/19 | DAC-KTM | | Project Termination Meeting | | | 5 |
| CIM325 | Science Coordinator | | Apr/19 | DAC-KTM | | Project Termination Meeting | | | 5 |
| CIM326 | Project Manager | | Apr/19 | DAC-KTM | | Project Termination Meeting | | | 5 |
| CIM327 | Consultant-Comms KMS | | Apr/19 | DAC-KTM | | Project Termination Meeting | | | 5 |
| CIM328 | Monitoring and Evaluation Consultant (M&E). | | Apr/19 | DAC-KTM | | Project Termination Meeting | | | 5 |
| CIM329 | Research Associate | | Apr/19 | DAC-KTM | | Project Termination Meeting | | | 5 |
| CIM330 | Project Agronomist | | Apr/19 | DAC-KTM | | Project Termination Meeting | | | 5 |
| CIM331 | Consultant - scaling | | Apr/19 | DAC-KTM | | Project Termination Meeting | | | 5 |
| CIM332 | SIP Thematic Leader | | Apr/19 | - | | Project Termination Meeting | | |  |
| CIM333 | SIP Program Director | | Apr/19 | MEX-KTM | | Project Termination Meeting | | | 8 |
| CIM334 | Project Leader | | Jun/19 | DAC-KTM-DEL/PAT/IXB | | Closing meetings in partner countries, discussion of way forward | | | 21 |
| CIM335 | Consultant- scaling | | Jun/19 | DAC-KTM-DEL/PAT/IXB | | Closing meetings in partner countries, discussion of way forward | | | 21 |
|  |  | |  |  | |  | | |  |

1. PC = partner country, A = Australia

#### PART B Australian Collaborating Organisation/s

|  |  |  |  |  |  |
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| **Trip no.** | **Person or position** | **Estimated date of travel** | **From / to** | **Purpose** | **Duration (days)** |
| **CSIRO** | | | | | |
| CS1 | Don Gaydon | May-14 | BNE-KTM | Inception Workshop | 14 |
| CS2 | Peter Brown | May-14 | CBR-KTM | Inception Workshop | 14 |
| CS3 | Toni Darbas | May-14 | BNE-KTM | Inception Workshop | 14 |
| CS4 | Perry Poulton | May-14 | TWB-DAC | Bangladesh Summer Planning Meeting | 14 |
| CS5 | Peter Brown | May-14 | CBR-PAT | India Summer Planning Meeting | 14 |
| CS6 | Don Gaydon | Jul-14 | BNE-IXB | Scenario Building Workshop | 14 |
| CS7 | Alison Laing | Jul-14 | TWB-IXB | Scenario Building Workshop | 14 |
| CS8 | Perry Poulton | Aug-14 | TWB-DAC | Bangladesh Study Tour | 14 |
| CS9 | Alison Laing | Aug-14 | BNE-DAC | Bangladesh Study Tour | 14 |
| CS10 | Toni Darbas | Aug-14 | BNE-IXB | India Study Tour and Winter Planning Meeting | 21 |
| CS11 | Peter Brown | Oct-14 | CBR-PAT | Project Planning Meeting | 14 |
| CS12 | Don Gaydon | Oct-14 | BNE-PAT | India Summer Planning Meeting | 14 |
| CS13 | Perry Poulton | Feb-15 | TWB-KTM | Nepal Study Tour | 14 |
| CS14 | Toni Darbas | Feb-15 | BNE-PAT | India Study Tour and FGD | 14 |
| CS15 | Don Gaydon | Apr-15 | BNE-PAT | India Summer Planning Meeting | 14 |
| CS16 | Alison Laing | Sep-15 | BNE-KTM | Nepal Winter Planning Meeting | 14 |
| CS17 | Don Gaydon | Sep-15 | BNE-PAT | Project Planning Meeting | 14 |
| CS18 | Peter Brown | Oct-15 | CBR-DAC | Project Planning Meeting | 14 |
| CS19 | Toni Darbas | Feb-16 | BNE-KTM | Nepal Study Tour, FGD and Planning Meeting | 21 |
| CS20 | Alison Laing | Feb-16 | BNE-KTM | Nepal Study Tour | 14 |
| CS21 | Alison Laing | Aug-16 | BNE-DAc | Bangladesh Study Tour | 14 |
| CS22 | Don Gaydon | Aug-16 | BNE-DAC | Bangladesh Study Tour | 14 |
| CS23 | Peter Brown | Sep-16 | CBR-KTM | Nepal Winter Planning Meeting | 14 |
| CS24 | Alison Laing | Sep-16 | BNE-IXB | India Winter Planning Meeting | 14 |
| CS25 | Toni Darbas | Oct-16 | BNE-IXB | Project Planning Meeting | 14 |
| CS26 | Alison Laing | Mar-17 | BNE-PAT | India Study Tour | 14 |
| CS27 | Peter Brown | Mar-17 | CBR-PAT | India Study Tour | 14 |
| CS28 | Alison Laing | Apr-17 | BNE-DAC | Bangladesh Summer Planning Meeting | 14 |
| CS29 | Toni Darbas | Aug-17 | BNE-PAT | India Study Tour | 14 |
| CS30 | Peter Brown | May-18 | CBR-DAC | Project Termination Workshop | 14 |
| CS31 | Alison Laing | Sep/17 | BNE-DAC | ARMP and Field visit | 5 |
| CS32 | Darbas | Sep/17 | BNE-DAC | IP short course &ARMP and Field visit | 10 |
| CS33 | Brown | Sep/17 | CBR-DAC | IP short course &ARMP and Field visit | 10 |
| CS34 | Brown | Jan/18 | CBR-DAC | M&E&L | 10 |
| CS35 | Alison | Jun/18 | CBR-KTM | Meeting: Conclusion activities SFRSI-1/ way forward | 5 |
| CS36 | Brown | Jun/18 | CBR-KTM | Meeting: Conclusion activities SFRSI-1/ way forward and M&E&L | 10 |
| CS37 | Brown | Sep/18 | CBR-KTM | ARMP and Field visit and M&E&L | 10 |
| CS38 | Brown | Jan/19 | CBR-KTM | M&E&L | 10 |
| CS39 | Brown | Apr/19 | PER-KTM | Project Termination Meeting | 8 |
| **Curtin University** | | | | | |
| CU1 | Fay Rola-Rubzen | May-14 | PER-KTM | Inception Workshop | 14 |
| CU2 | Roy Murray-Prior | May-14 | PER-KTM | Inception Workshop | 14 |
| CU3 | Roy Murray-Prior | Aug-14 | PER-KTM | Nepal Study Tour | 14 |
| CU4 | Fay Rola-Rubzen | Sep-14 | PER-PAT/IXB | India Winter Planning Meeting | 14 |
| CU5 | Roy Murray-Prior | Mar-15 | PER-KTM | Nepal Study Tour | 14 |
| CU6 | Roy Murray-Prior | Mar-15 | PER-PAT/IXB | India Study Tour | 14 |
| CU7 | Fay Rola-Rubzen | Mar-15 | PER-DAC | Bangladesh Study Tour | 14 |
| CU8 | Fay Rola-Rubzen | Mar-16 | PER-DAC | Bangladesh Study Tour | 14 |
| CU9 | Fay Rola-Rubzen | Mar-16 | PER-PAT/IXB | India Study Tour | 14 |
| CU10 | Roy Murray-Prior | Aug-16 | PER-KTM | Nepal Study Tour | 14 |
| CU11 | Roy Murray-Prior | Sep-16 | PER-PAT/IXB | India Winter Planning Meeting | 14 |
| CU12 | Fay Rola-Rubzen | Mar-17 | PER-DAC | Bangladesh Study Tour | 14 |
| CU13 | Roy Murray-Prior | Mar-17 | PER-KTM | Nepal Study Tour | 14 |
| CU14 | Roy Murray-Prior | Mar-17 | PER-PAT/IXB | India Study Tour | 14 |
| CU15 | Fay Rola-Rubzen | Mar-18 | PER-DAC | Bangladesh Study Tour | 14 |
| CU16 | Fay Rola-Rubzen | Mar-18 | PER-PAT/IXB | India Study Tour | 14 |
| CU17 | Rola-Rubzen | Sep/17 | PER-DAC | ARMP and Field visit | 5 |
| CU18 | Rola-Rubzen | Oct/17 | PER-KTM/IXB | Business models for women | 5 |
| CU19 | Rola-Rubzen | Sep/18 | PER-KTM | ARMP and Field visit | 4 |
| CU20 | Rola-Rubzen | Nov/18 | PER-KTM | Business models for women | 5 |
| CU21 | Rola-Rubzen | Feb/19 | PER-KTM-IXB | Gender mainstreaming | 4 |
| CU22 | Rola-Rubzen | Apr/19 | PER-KTM | Project Termination Meeting | 8 |
| **University of Queensland** | | | | | |
| UQ1 | Neal Menzies | May-14 | BNE-KTM | Inception Workshop | 14 |
| UQ2 | Ram Dalal | May-14 | BNE-KTM | Inception Workshop | 14 |
| UQ3 | Ram Dalal | Aug-14 | BNE-PAT/IXB | India Study Tour | 14 |
| UQ4 | Neal Menzies | Sep-14 | BNE-PAT/IXB | India Winter Planning Meeting | 14 |
| UQ5 | Ram Dalal | Mar-15 | BNE-PAT/IXB | India Study Tour | 14 |
| UQ6 | Neal Menzies | Mar-15 | BNE-BIR | Nepal Study Tour | 14 |
| UQ7 | Ram Dalal | Aug-15 | BNE-PAT/IXB | India Study Tour | 14 |
| UQ8 | Neal Menzies | Sep-15 | BNE-BIR | Nepal Winter Planning Meeting | 14 |
| UQ9 | Ram Dalal | Mar-16 | BNE-BIR | Nepal Study Tour | 14 |
| UQ10 | Ram Dalal | Mar-16 | BNE-PAT/IXB | India Study Tour | 14 |
| UQ11 | Ram Dalal | Aug-16 | BNE-PAT/IXB | India Study Tour | 14 |
| **University of New England** | | | | | |
| UNE1 | Julian Prior | May-14 | ARM-KTM | Inception Workshop | 14 |
| UNE2 | Julian Prior | Sep-14 | ARM-PAT/IXB | India Winter Planning Meeting | 14 |

#### PART C NARES Partners

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Trip no. | Person or position | | | Estimated date of travel | | From / to | | Purpose | | Duration  (days) | |
| NAR1 | | 1 Representative BARC | | May-14 | | DAC-KTM | | Inception Workshop | | 7 | |
| NAR2 | | 2 Participants BARI | | May-14 | | DAC-KTM | | Inception Workshop | | 7 | |
| NAR3 | | 1 Participant BARI | | Oct-14 | | DAC-PAT | | 2014 Project Planning Meeting | | 5 | |
| NAR4 | | 1 Participant BARI | | Oct-16 | | DAC-IXB | | 2016 Project Planning Meeting | | 5 | |
| NAR5 | | 1 Participant BARI | | Oct-17 | | DAC-KTM | | 2017 Project Planning Meeting | | 5 | |
| NAR6 | | 2 participants RDRS | | May-14 | | DAC-KTM | | Inception Workshop | | 7 | |
| NAR7 | | 1 Participant RDRS | | Oct-14 | | DAC-PAT | | 2014 Project Planning Meeting | | 5 | |
| NAR8 | | 1 Participant RDRS | | Oct-16 | | DAC-IXB | | 2016 Project Planning Meeting | | 5 | |
| NAR9 | | 1 Participant RDRS | | Oct-17 | | DAC-KTM | | 2017 Project Planning Meeting | | 5 | |
| NAR10 | | 2 participants DAE | | May-14 | | DAC-KTM | | Inception Workshop | | 7 | |
| NAR11 | | 1 Participant DAE Bangladesh | | Oct-14 | | DAC-PAT | | 2014 Project Planning Meeting | | 5 | |
| NAR12 | | 2 representatives ICAR | | May-14 | | PAT-KTM | | Inception Workshop | | 7 | |
| NAR13 | | 1 participant ICAR | | Oct-15 | | PAT-DAC | | 2015 Project Planning Meeting | | 5 | |
| NAR14 | | 1 participant ICAR | | Oct-16 | | PAT-IXB | | 2016 Project Planning Meeting | | 5 | |
| NAR15 | | 1 participant ICAR | | Oct-17 | | PAT-KTM | | 2017 Project Planning Meeting | | 5 | |
| NAR16 | | 2 representatives BAU | | May-14 | | PAT-KTM | | Inception Workshop | | 7 | |
| NAR17 | | 1 participant BAU | | Oct-15 | | PAT-DAC | | 2015 Project Planning Meeting | | 5 | |
| NAR18 | | 1 participant BAU | | Oct-16 | | PAT-IXB | | 2016 Project Planning Meeting | | 5 | |
| NAR19 | | 1 participant BAU | | Oct-17 | | PAT-KTM | | 2017 Project Planning Meeting | | 5 | |
| NAR20 | | 2 representatives JEEViKA | | May-14 | | PAT-KTM | | Inception Workshop | | 7 | |
| NAR21 | | 2 representatives Sakhi | | May-14 | | PAT-KTM | | Inception Workshop | | 7 | |
| NAR22 | | 2 representatives DoA-Bihar | | May-14 | | PAT-KTM | | Inception Workshop | | 7 | |
| NAR23 | | 2 representatives NARC | | May-14 | | BIR-KTM | | Inception Workshop | | 7 | |
| NAR24 | | 1 Participant NARC | | Oct-14 | | KTM-PAT | | 2014 Project Planning Meeting | | 5 | |
| NAR25 | | 1 Participant NARC | | Oct-15 | | KTM-DAC | | 2015 Project Planning Meeting | | 5 | |
| NAR26 | | 1 Participant NARC | | Oct-16 | | KTM-IXB | | 2016 Project Planning Meeting | | 5 | |
| NAR27 | | 2 representatives DoA-Nepal | | May-14 | | BIR-KTM | | Inception Workshop | | 7 | |
| NAR28 | | 1 Participant Nepal Department of Agriculture | | Oct-14 | | KTM-PAT | | 2014 Project Planning Meeting | | 5 | |
| NAR29 | | 2 representatives UBKV | | May-14 | | IXB-KTM | | Inception Workshop | | 7 | |
| NAR30 | | 1 Representative UBKV | | Oct-14 | | IXB-PAT | | 2014 Project Planning Meeting | | 5 | |
| NAR31 | | 1 Representative UBKV | | Oct-15 | | IXB-DAC | | 2015 Project Planning Meeting | | 5 | |
| NAR32 | | 1 Representative UBKV | | Oct-17 | | IXB-KTM | | 2017 Project Planning Meeting | | 5 | |
| NAR33 | | 2 representatives DoA-WB | | May-14 | | IXB-KTM | | Inception Workshop | | 7 | |
| NAR34 | | 1 participant West Bengal Department of Agriculture | | Oct-14 | | IXB-PAT | | 2014 Project Planning Meeting | | 5 | |
| **The following trips are incorporated into CIMMYT's budget as recipient organizations are not determined at this time.** | | | | | | | | | | | |
| NAR35 | | | 2 people from Bangladesh | | Jul-14 | | DAC-IXB | | Scenario Building Workshop | | 6 |
| NAR36 | | | 2 persons from Bihar | | Jul-14 | | PAT-IXB | | Scenario Building Workshop | | 6 |
| NAR37 | | | 2 people from Nepal | | Jul-14 | | -IXB | | Scenario Building Workshop | | 6 |
| NAR38 | | | Bangladesh Coordinator | | Aug-14 | | DAC-BIR | | Nepal Summer Study Tour | | 5 |
| NAR39 | | | West Bengal Coordinator | | Aug-14 | | IXB-DAC | | Bangladesh Summer Study Tour | | 5 |
| NAR40 | | | Nepal Coordinator | | Aug-14 | | KTM-PAT | | Bihar Summer Study Tour | | 5 |
| NAR41 | | | Bihar Coordinator | | Aug-14 | | PAT-IXB | | West Bengal Summer Study Tour | | 5 |
| NAR42 | | | Bangladesh Coordinator | | Nov-14 | | DAC-PAT | | 2014 Steering Committee Meeting | | 3 |
| NAR43 | | | Bangladesh SC Member | | Nov-14 | | DAC-PAT | | 2014 Steering Committee Meeting | | 3 |
| NAR44 | | | India SC Member | | Nov-14 | | DEL-PAT | | 2014 Steering Committee Meeting | | 3 |
| Trip no. | | | Person or position | | Estimated date of travel | | From / to | | Purpose | | Duration  (days) |
| NAR45 | | | WB Coordinator | | Nov-14 | | IXB-PAT | | 2014 Steering Committee Meeting | | 3 |
| NAR46 | | | Nepal Coordinator | | Nov-14 | | KTM-PAT | | 2014 Steering Committee Meeting | | 3 |
| NAR47 | | | Nepal SC Member | | Nov-14 | | KTM-PAT | | 2014 Steering Committee Meeting | | 3 |
| NAR48 | | | Bangladesh Coordinator | | Feb-15 | | DAC-IXB | | West Bengal Winter Study Tour | | 5 |
| NAR49 | | | West Bengal Coordinator | | Feb-15 | | IXB-BIR | | Nepal Winter Study Tour | | 5 |
| NAR50 | | | Nepal Coordinator | | Feb-15 | | KTM-IXB | | West Bengal Winter Study Tour | | 5 |
| NAR51 | | | Bihar Coordinator | | Feb-15 | | PAT-DAC | | Bangladesh Winter Study Tour | | 5 |
| NAR52 | | | Bangladesh Coordinator | | Aug-15 | | DAC-IXB | | West Bengal Summer Study Tour | | 5 |
| NAR53 | | | West Bengal Coordinator | | Aug-15 | | IXB-PAT | | Bihar Summer Study Tour | | 5 |
| NAR54 | | | Nepal Coordinator | | Aug-15 | | KTM-DAC | | Bangladesh Summer Study Tour | | 5 |
| NAR55 | | | Bihar Coordinator | | Aug-15 | | PAT-BIR | | Nepal Summer Study Tour | | 5 |
| NAR56 | | | Bangladesh SC Member | | Nov-15 | | DAC-DAC | | 2015 Steering Committee Meeting | | 1 |
| NAR57 | | | India SC Member | | Nov-15 | | DEL-DAC | | 2015 Steering Committee Meeting | | 3 |
| NAR58 | | | WB Coordinator | | Nov-15 | | IXB-DAC | | 2015 Steering Committee Meeting | | 3 |
| NAR59 | | | Nepal Coordinator | | Nov-15 | | KTM-DAC | | 2015 Steering Committee Meeting | | 3 |
| NAR60 | | | Nepal SC Member | | Nov-15 | | KTM-DAC | | 2015 Steering Committee Meeting | | 3 |
| NAR61 | | | Bihar Coordinator | | Nov-15 | | PAT-DAC | | 2015 Steering Committee Meeting | | 3 |
| NAR62 | | | Bangladesh Coordinator | | Feb-16 | | DAC-BIR | | Nepal Winter Study Tour | | 5 |
| NAR63 | | | West Bengal Coordinator | | Feb-16 | | IXB-DAC | | Bangladesh Winter Study Tour | | 5 |
| NAR64 | | | Nepal Coordinator | | Feb-16 | | KTM-PAT | | Bihar Winter Study Tour | | 5 |
| NAR65 | | | Bihar Coordinator | | Feb-16 | | PAT-IXB | | West Bengal Winter Study Tour | | 5 |
| NAR66 | | | Bangladesh Coordinator | | Aug-16 | | DAC-PAT | | Bihar Summer Study Tour | | 5 |
| NAR67 | | | West Bengal Coordinator | | Aug-16 | | IXB-BIR | | Nepal Summer Study Tour | | 5 |
| NAR68 | | | Nepal Coordinator | | Aug-16 | | KTM-IXB | | West Bengal Summer Study Tour | | 5 |
| NAR69 | | | Bihar Coordinator | | Aug-16 | | PAT-DAC | | Bangladesh Summer Study Tour | | 5 |
| NAR70 | | | Bangladesh Coordinator | | Nov-16 | | DAC-KTM | | 2016 Steering Committee Meeting | | 3 |
| NAR71 | | | Bangladesh SC Member | | Nov-16 | | DAC-KTM | | 2016 Steering Committee Meeting | | 3 |
| NAR72 | | | India SC Member | | Nov-16 | | DEL-KTM | | 2016 Steering Committee Meeting | | 3 |
| NAR73 | | | WB Coordinator | | Nov-16 | | IXB-KTM | | 2016 Steering Committee Meeting | | 3 |
| NAR74 | | | Nepal SC Member | | Nov-16 | | KTM-KTM | | 2016 Steering Committee Meeting | | 1 |
| NAR75 | | | Bihar Coordinator | | Nov-16 | | PAT-KTM | | 2016 Steering Committee Meeting | | 3 |
| NAR76 | | | Bangladesh Coordinator | | Feb-17 | | DAC-IXB | | West Bengal Winter Study Tour | | 5 |
| NAR77 | | | West Bengal Coordinator | | Feb-17 | | IXB-PAT | | Bihar Winter Study Tour | | 5 |
| NAR78 | | | Nepal Coordinator | | Feb-17 | | KTM-DAC | | Bangladesh Winter Study Tour | | 5 |
| NAR79 | | | Bihar Coordinator | | Feb-17 | | PAT-BIR | | Nepal Winter Study Tour | | 5 |
| NAR80 | | | Bangladesh Coordinator | | Aug-17 | | DAC-BIR | | Nepal Summer Study Tour | | 5 |
| NAR81 | | | West Bengal Coordinator | | Aug-17 | | IXB-DAC | | Bangladesh Summer Study Tour | | 5 |
| NAR82 | | | Nepal Coordinator | | Aug-17 | | KTM-PAT | | Bihar Summer Study Tour | | 5 |
| NAR83 | | | Bihar Coordinator | | Aug-17 | | PAT-IXB | | West Bengal Summer Study Tour | | 5 |
| NAR84 | | | Bangladesh Coordinator | | Nov-17 | | DAC-IXB | | 2017 Steering Committee Meeting | | 3 |
| NAR85 | | | Bangladesh SC Member | | Nov-17 | | DAC-IXB | | 2017 Steering Committee Meeting | | 3 |
| NAR86 | | | India SC Member | | Nov-17 | | DEL-IXB | | 2017 Steering Committee Meeting | | 3 |
| NAR87 | | | Nepal Coordinator | | Nov-17 | | KTM-IXB | | 2017 Steering Committee Meeting | | 3 |
| NAR88 | | | Nepal SC Member | | Nov-17 | | KTM-IXB | | 2017 Steering Committee Meeting | | 3 |
| NAR89 | | | Bihar Coordinator | | Nov-17 | | PAT-IXB | | 2017 Steering Committee Meeting | | 3 |
| NAR90 | | | Bangladesh Coordinator | | Feb-18 | | DAC-PAT | | Bihar Winter Study Tour | | 5 |
| NAR91 | | | West Bengal Coordinator | | Feb-18 | | IXB-BIR | | Nepal Winter Study Tour | | 5 |
| NAR92 | | | Nepal Coordinator | | Feb-18 | | KTM-IXB | | West Bengal Winter Study Tour | | 5 |
| NAR93 | | | Bihar Coordinator | | Feb-18 | | PAT-DAC | | Bangladesh Winter Study Tour | | 5 |
| NAR94 | | | WB Coordinator | | May-18 | | IXB-DAC | | 2017 Project Termination Meeting | | 5 |
| NAR95 | | | Nepal Coordinator | | May-18 | | KTM-DAC | | 2017 Project Termination Meeting | | 5 |
| NAR96 | | | Bihar Coordinator | | May-18 | | PAT-DAC | | 2017 Project Termination Meeting | | 5 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Trip no. | Person or position | | | Estimated date of travel | | From / to | Purpose | | Duration  (days) |
| NAR97 | | Bangladesh Coordinator | Sep/18 | | DAC-SAID | | | ARPM and field visit | 5 |
| NAR98 | | West Bengal Coordinator | Sep/18 | | IXB-DAC-SAID | | | ARPM and field visit | 5 |
| NAR99 | | Nepal Coordinator | Sep/18 | | KTM-DAC-SAID | | | ARPM and field visit | 5 |
| NAR100 | | Bihar Coordinator | Sep/18 | | PAT-IXB-DAC-SAID | | | ARPM and field visit | 5 |
| NAR101 | | Bangladesh Scientists | Sep/18 | | DAC-KTM | | | ARPM and field visit | 10 |
| NAR102 | | West Bengal Scientists | Sep/18 | | IXB-KTM-BIR | | | ARPM and field visit | 10 |
| NAR103 | | Nepal Scientists | Sep/18 | | KTM-BIR | | | ARPM and field visit | 10 |
| NAR104 | | Bihar Scientist | Sep/18 | | PAT-KTM-BIR | | | ARMP and Field visit | 10 |
| NAR105 | | Bangladesh Scientists | Oct/18 | | DAC-IXB-PAT | | | ToTs on CASI | 5 |
| NAR106 | | West Bengal Scientists | Oct/18 | | IXB-PAT-DAC | | | ToTs on CASI | 5 |
| NAR107 | | Nepal Scientists | Oct/18 | | KTM-PAT-DAC | | | ToTs on CASI | 5 |
| NAR108 | | Bihar Scientist | Oct/18 | | PAT-IXB-DAC | | | ToTs on CASI | 5 |
| NAR109 | | Bangladesh Scientists | Oct/18 | | DAC-IXB-PAT | | | Train CBF or enumerators | 5 |
| NAR110 | | West Bengal Scientists | Oct/18 | | IXB-PAT-DAC | | | Train CBF or enumerators | 5 |
| NAR111 | | Nepal Scientists | Oct/18 | | KTM-PAT-DAC | | | Train CBF or enumerators | 5 |
| NAR112 | | Bihar Scientist | Oct/18 | | PAT-IXB-DAC | | | Train CBF or enumerators | 5 |
| NAR113 | | Bangladesh Scientists | Oct/18 | | DAC-IXB-PAT | | | Training modules | 5 |
| NAR114 | | West Bengal Scientists | Oct/18 | | IXB-PAT-DAC | | | Training module | 5 |
| NAR115 | | Nepal Scientists | Oct/18 | | KTM-PAT-DAC | | | Training module | 5 |
| NAR116 | | Bihar Scientist | Oct/18 | | PAT-IXB-DAC | | | Train micro-entrepreneurs | 10 |
| NAR117 | | Bangladesh Scientists | Oct/18 | | DAC-IXB-PAT | | | Train micro-entrepreneurs | 10 |
| NAR118 | | West Bengal Scientists | Oct/18 | | IXB-PAT-DAC | | | Train micro-entrepreneurs | 10 |
| NAR119 | | Nepal Scientists | Oct/18 | | KTM-PAT-DAC | | | Train micro-entrepreneurs | 10 |
| NAR120 | | Bangladesh Scientists | Oct/18 | | DAC-IXB-PAT | | | Improve agro-dealers and market for.. | 10 |
| NAR121 | | West Bengal Scientists | Oct/18 | | IXB-PAT-DAC | | | Training to improve agro-dealers and market for.. | 10 |
| NAR122 | | Nepal Scientists | Oct/18 | | KTM-PAT-DAC | | | Improve agro-dealers and market for.. | 10 |
| NAR123 | | Bangladesh Scientists | Nov/18 | | DAC-IXB-PAT | | | Business models for women | 10 |
| NAR124 | | West Bengal Scientists | Nov/18 | | IXB-PAT-DAC | | | Business models for women | 10 |
| NAR125 | | Nepal Scientists | Nov/18 | | KTM-PAT-DAC | | | Business models for women | 10 |
| NAR126 | | Bihar Scientist | Nov/18 | | PAT-IXB-DAC | | | Business models for women | 10 |
| NAR127 | | Bangladesh Scientists | Nov/18 | | DAC-IXB-PAT | | | Train service providers | 10 |
| NAR128 | | West Bengal Scientists | Nov/18 | | IXB-PAT-DAC | | | Train service providers | 10 |
| NAR129 | | Nepal Scientists | Nov/18 | | KTM-PAT-DAC | | | Train service providers | 10 |
| NAR130 | | Bihar Scientist | Nov/18 | | PAT-IXB-DAC | | | Train service providers | 10 |
| NAR131 | | Bangladesh Scientists | Nov/18 | | TBD | | | FGDs | 4 |
| NAR132 | | West Bengal Scientists | Nov/18 | | TBD | | | FGDs | 4 |
| NAR133 | | Nepal Scientists | Dec/18 | | TBD | | | FGDs | 4 |
| NAR134 | | Bangladesh Scientists | Dec/18 | | TBD | | | FGDs | 4 |
| NAR135 | | West Bengal Scientists | Dec/18 | | TBD | | | FGDs | 4 |
| NAR136 | | Nepal Scientists | Dec/18 | | TBD | | | FGDs | 4 |
| NAR137 | | Bangladesh Scientists | Dec/18 | | TBD | | | Field days | 5 |
| NAR138 | | West Bengal Scientists | Dec/18 | | TBD | | | Field days | 5 |
| NAR139 | | Nepal Scientists | Dec/18 | | TBD | | | Field days | 5 |
| NAR140 | | Bangladesh Scientists | Jan/19 | | DAC-KTM-DEL/PAT/IXB | | | Training on seeds | 5 |
| NAR141 | | West Bengal Scientists | Jan/19 | | DAC-KTM-DEL/PAT/IXB | | | Training on seeds | 5 |
| NAR142 | | Nepal Scientists | Jan/19 | | DAC-KTM-DEL/PAT/IXB | | | Training on seeds | 5 |
| NAR143 | | Bangladesh Coordinator | Apr/19 | | DAC-KTM | | | Project Termination Meeting | 5 |
| NAR144 | | West Bengal Coordinator | Apr/19 | | IXB-KTM | | | Project Termination Meeting | 5 |
| NAR145 | | Nepal Coordinator | Apr/19 | | - | | | Project Termination Meeting | 5 |
| NAR146 | | Bihar Coordinator | Apr/19 | | PAT/DEL-KTM | | | Project Termination Meeting | 5 |
| NAR147 | | Bangladesh Scientists | Apr/19 | | DAC-KTM | | | Project Termination Meeting | 5 |
| NAR148 | | West Bengal Scientists | Apr/19 | | IXB/PAT-KTM | | | Project Termination Meeting | 5 |
| NAR149 | | Nepal Scientists | Apr/19 | | BIR-KTM | | | Project Termination Meeting | 5 |
| NAR150 | | Bihar Scientist | Apr/19 | | PAT-DEL-KTM | | | Project Termination Meeting | 5 |
| NAR151 | | NARES Leadership - BD | Apr/19 | | DAC-KTM | | | Project Termination Meeting | 5 |
| NAR152 | | NARES Leadership - Bihar | Apr/19 | | PAT-DEL-KTM | | | Project Termination Meeting | 5 |
| NAR153 | | NARES Leadership - WB | Apr/19 | | IXB-KTM | | | Project Termination Meeting | 5 |
| NAR154 | | NARES Leadership - Nepal | Apr/19 | | - | | | Project Termination Meeting | 5 |
| NAR155 | | RDRS | Sep/17 | | PAT/DEL-DAC | | | ARPM and field visit | 5 |
| NAR156 | | RDRS | Feb/18 | | PAT-IXB | | | Winter crops monitoring and project evaluation | 5 |
| NAR157 | | RDRS | Sep/18 | | PAT/DEL-KTM | | | ARPM and field visit | 5 |
| NAR158 | | RDRS | Oct/18 | | PAT-DEL-KTM-IXB-DAC | | | ToTs on CASI | 5 |
| NAR159 | | RDRS | Oct/18 | | ,, | | | Train CBF or enumerators | 5 |
| NAR160 | | RDRS | Oct/18 | | PAT-DEL-KTM-IXB | | | Business models for women | 2 |
| NAR161 | | RDRS | Nov/18 | | PAT-DEL-KTM-IXB | | | Train service providers | 2 |
| NAR162 | | RDRS | Jan/19 | | ,, | | | Training on seeds | 2 |
| NAR163 | | RDRS | Apr/19 | | PAT/DEL-KTM | | | Project Termination Meeting | 5 |
| NAR164 | | JEEViKA | Sep/17 | | PAT/DEL-DAC | | | ARPM and field visit | 5 |
| NAR165 | | JEEViKA | Feb/18 | | PAT-IXB | | | Winter crops monitoring and project evaluation | 5 |
| NAR166 | | JEEViKA | Sep/18 | | PAT/DEL-KTM | | | ARPM and field visit | 5 |
| NAR167 | | JEEViKA | Oct/18 | | PAT-DEL-KTM-IXB-DAC | | | ToTs on CASI | 5 |
| NAR168 | | JEEViKA | Oct/18 | | ,, | | | Train CBF or enumerators | 5 |
| NAR169 | | JEEViKA | Oct/18 | | PAT-DEL-KTM-IXB | | | Business models for women | 2 |
| NAR170 | | JEEViKA | Nov/18 | | PAT-DEL-KTM-IXB | | | Train service providers | 2 |
| NAR171 | | JEEViKA | Jan/19 | | ,, | | | Training on seeds | 2 |
| NAR172 | | JEEViKA | Apr/19 | | PAT/DEL-KTM | | | Project Termination Meeting | 5 |
| NAR173 | | Agrevolution | Sep/17 | | PAT/DEL-DAC | | | ARPM and field visit | 5 |
| NAR174 | | Agrevolution | Feb/18 | | PAT-IXB | | | Winter crops monitoring and project evaluation | 5 |
| NAR175 | | Agrevolution | Sep/18 | | PAT/DEL-KTM | | | ARPM and field visit | 5 |
| NAR176 | | Agrevolution | Oct/18 | | PAT-DEL-KTM-IXB-DAC | | | ToTs on CASI | 5 |
| NAR177 | | Agrevolution | Oct/18 | | ,, | | | Train CBF or enumerators | 5 |
| NAR178 | | Agrevolution | Oct/18 | | PAT-DEL-KTM-IXB | | | Business models for women | 2 |
| NAR179 | | Agrevolution | Nov/18 | | PAT-DEL-KTM-IXB | | | Train service providers | 2 |
| NAR180 | | Agrevolution | Jan/19 | | ,, | | | Training on seeds | 2 |
| NAR181 | | Agrevolution | Apr/19 | | PAT/DEL-KTM | | | Project Termination Meeting | 5 |
| NAR182 | | FORWARD | Feb/18 | | BHT-KTM-IXB | | | Winter crops monitoring and project evaluation | 5 |
| NAR183 | | FORWARD | Sep/18 | | BHT-KTM | | | ARPM and field visit | 5 |
| NAR184 | | FORWARD | Oct/18 | | BHT-KTM-IXB-DAC | | | ToTs on CASI | 5 |
| NAR185 | | FORWARD | Oct/18 | | ,, | | | Train CBF or enumerators | 5 |
| NAR186 | | FORWARD | Oct/18 | | ,, | | | Business models for women | 2 |
| NAR187 | | FORWARD | Nov/18 | | ,, | | | Train service providers | 2 |
| NAR188 | | FORWARD | Jan/19 | | ,, | | | Training on seeds | 2 |
| NAR189 | | FORWARD | Apr/19 | | BHT-KTM | | | Project Termination Meeting | 5 |

***Part C (contd.) International and Regional Partners.***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Trip no. | | Person or position | Estimated date of travel | From / to | Purpose | Duration  (days) |
| **IFPRI** | | | | | | |
| IFP1 | | P.K. Joshi | May-14 | DEL-KTM | Inception Workshop | 7 |
| IFP2 | | Research Analyst | May-14 | DEL-BIR | Policy surveys and FGD | 5 |
| IFP3 | | Research Analyst | May-14 | DEL-PAT-IXB | Policy surveys and FGD | 5 |
| IFP4 | | Research Analyst | Jun-14 | DEL-DAC | Policy surveys and FGD | 5 |
| IFP5 | | Research Analyst | Sep-14 | DEL-PAT-IXB | Policy surveys and FGD | 5 |
| IFP6 | | Post-doc | Sep-14 | DEL-PAT-IXB | Policy surveys and FGD | 5 |
| IFP7 | | Research Analyst | Nov-14 | DEL-DAC | Policy surveys and FGD | 5 |
| IFP8 | | Post-doc | Nov-14 | DEL-DAC | Policy surveys and FGD | 5 |
| IFP9 | | Research Analyst | Mar-15 | DEL-BIR | Policy surveys and FGD | 5 |
| IFP10 | | Post-doc | Mar-15 | DEL-BIR | Policy surveys and FGD | 5 |
| IFP11 | | Research Analyst | Sep-15 | DEL-BIR | Policy surveys and FGD | 5 |
| IFP12 | | Post-doc | Sep-15 | DEL-BIR | Policy surveys and FGD | 5 |
| IFP13 | | Research Analyst | Jan-16 | DEL-DAC | Policy surveys and FGD | 5 |
| IFP14 | | Post-doc | Jan-16 | DEL-DAC | Policy surveys and FGD | 5 |
| IFP15 | | Research Analyst | May-16 | DEL-PAT-IXB | Policy surveys and FGD | 5 |
| IFP16 | | Post-doc | May-16 | DEL-PAT-IXB | Policy surveys and FGD | 5 |
| IFP17 | | Research Analyst | Sep-16 | DEL-PAT-IXB | Policy surveys and FGD | 5 |
| IFP18 | | Post-doc | Sep-16 | DEL-PAT-IXB | Policy surveys and FGD | 5 |
| IFP19 | | Research Analyst | Oct-16 | DEL-DAC | Policy surveys and FGD | 5 |
| IFP20 | | Post-doc | Oct-16 | DEL-DAC | Policy surveys and FGD | 5 |
| IFP21 | | Research Analyst | Nov-16 | DEL-BIR | Policy surveys and FGD | 5 |
| IFP22 | | Post-doc | Nov-16 | DEL-BIR | Policy surveys and FGD | 5 |
| IFP23 | | Post-doc | Mar-17 | DEL-PAT-IXB | Policy surveys and FGD | 5 |
| IFP24 | | Avinash | Sep/17 | DEL-DAC | ARPM and field visit | 5 |
| IFP25 | | Avinash | Feb/18 | DEL-KTM | Winter crops monitoring and project evaluation | 5 |
| IFP26 | | Avinash | Sep/18 | DEL-KTM | ARPM and field visit | 5 |
| IFP27 | | Avinash | Oct/18 | TBD | ToTs on CASI | 5 |
| IFP28 | | Avinash | Oct/18 | DEL-KTM | Train CBF or enumerators | 5 |
| IFP29 | | Avinash | Oct/18 | DEL-IXB-DAC | Business models for women | 2 |
| IFP30 | | Avinash | Nov/18 | DEL-KTM-IXB-DAC | Train service providers | 2 |
| IFP31 | | Avinash | Jan/19 | ,, | Training on seeds | 2 |
| IFP32 | | Avinash | Apr/19 | DEL-KTM | Project Termination Meeting | 5 |
| IFP33 | | P.K Joshi | Apr/19 | DEL-KTM | Project Termination Meeting | 5 |
| **IWMI** | | | | | | |
| IWM1 | | Fraser Sugden | May-14 | KTM-PAT | Surveys | 7 |
| IWM2 | | Fraser Sugden | Jun-14 | KTM-IXB | Surveys | 7 |
| IWM3 | | Fraser Sugden | May-14 | KTM-BIR | Surveys | 7 |
| IWM4 | | Farhat Naz | May-14 | DEL-PAT | Surveys | 7 |
| IWM5 | | Farhat Naz | Jun-14 | DEL-IXB | Surveys | 7 |
| IWM6 | | Farhat Naz | May-14 | DEL-BIR | Surveys | 7 |
| IWM7 | | Niki Maskey | May-14 | KTM-BIR | Surveys | 7 |
| IWM8 | | Niki Maskey | May-14 | KTM-PAT | Surveys | 7 |
| IWM9 | | Niki Maskey | Jun-14 | KTM-IXB | Surveys | 7 |
| IWM10 | | Sanjiv da Silva | Jun-14 | CMB-DAC | Surveys | 7 |
| IWM11 | | Sanjiv da Silva | Aug-14 | CMB-DAC | Surveys | 7 |
| **IRRI** | | | | | | |
| IRR1 | Roland Buresh | | May-14 | MNL-KTM | Inception Workshop | 7 |
| IRR2 | Roland Buresh | | Oct-14 | MNL-DAC | Decision Support Tool Meeting | 5 |
| IRR3 | Agronomist | | Oct-14 | MNL-DAC | Decision Support Tool Meeting | 5 |
| IRR4 | Roland Buresh | | Oct-15 | MNL-DAC | Decision Support Tool Meeting | 5 |
| **iDE** | | | | | | |
| iDE1 | iDE staff | | May-14 | KTM-BIR | Business model development | 5 |
| iDE2 | iDE staff | | May-14 | KTM-BIR | Business model development | 5 |
| iDE3 | iDE staff | | Jun-14 | KTM-BIR | Business model course | 5 |
| iDE4 | iDE staff | | Aug-14 | KTM-BIR | Business model course | 5 |
| iDE5 | iDE staff | | Oct-14 | KTM-BIR | Commercial Pocket development | 5 |
| iDE6 | iDE staff | | Oct-14 | KTM-PAT | Commercial Pocket development | 5 |
| iDE7 | iDE staff | | Nov-14 | KTM-BIR | Commercial Pocket development | 5 |
| iDE8 | iDE staff | | Nov-14 | KTM-IXB | Commercial Pocket development | 5 |
| iDE9 | iDE staff | | Mar-15 | KTM-BIR | Commercial Pocket development | 5 |
| iDE10 | iDE staff | | Mar-15 | KTM-BIR | Commercial Pocket development | 5 |
| iDE11 | iDE staff | | May-15 | KTM-PAT | Business model development | 5 |
| iDE12 | iDE staff | | Jun-15 | KTM-IXB | Business model development | 5 |

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# Appendix A: Intellectual property register

Inquiries concerning completion of this form should be directed to <[contracts@aciar.gov.au](mailto:contracts@aciar.gov.au)>.

## Administrative details

|  |  |
| --- | --- |
| Project ID | **CSE/2011/077 Variation 4** |
| Project title | Sustainable and Resilient Farming Systems Intensification in the Eastern Gangetic Plains (‘SRFSI’) |
| Assessment provider | Intellectual Property Counsel |
| If not Australian project leader, provide title | Itzel Saldivar, Intellectual Property Counsel, Legal department, CIMMYT I. Saldivar@cgiar.org |
| Date of assessment | var.4 updated 18 May 2019 |

## Categories of intellectual property and brief description

#### Plant or animal germplasm exchange

|  |  |  |
| --- | --- | --- |
| Does the project involve: | Yes | No |
| provision of germplasm by Australia to a partner country? |  | X |
| provision of germplasm from a partner country to Australia? |  | X |
| provision of germplasm from or to an IARC or another organisation and a project participant? |  | X |
| use of germplasm from a third party |  | X |
| material subject to plant breeders/variety rights in Australia or another country? |  | X |

If “yes” to any of the above, for each applicable country provide brief details of the material to be exchanged:

If the germplasm exchange can be finalised before the project commencement, provide a Materials Transfer Agreement.

If the specific germplasm to be exchanged cannot be identified until after project commencement, indicate the type of material likely to be exchanged.

|  |  |
| --- | --- |
| Country | Details of plant or animal germplasm exchange |
|  |  |
|  |  |

#### Proprietary materials, techniques and information

|  |  |  |
| --- | --- | --- |
| Does the project involve provision (from one party to another) of: | Yes | No |
| research materials or reagents (e.g. enzymes, molecular markers, promoters)? |  | X |
| proprietary techniques or procedures? |  | X |
| data | X |  |
| proprietary computer software? | X |  |

“Data” means all data produced, acquired or used by a Party for the purposes of conducting the Project including technical know-how and information reduced to material form by that Party.

If "yes" to any of the above, for each applicable country provide:

brief details of the materials or information, the organisation providing, and the organisation receiving the materials

a copy of any formal contract between the parties.

|  |  |
| --- | --- |
| Country | Details of proprietary materials, techniques and information |
| Provider based in Australia, details of the agreement applicable to all target countries | ADOPT (Adoption and Diffusion Outcome Prediction Tool) is an MS Excel-based tool that evaluates and predicts the likely level of adoption and diffusion of specific agricultural technologies and practices, with a particular target population in mind. This software is the property of CISRO.  Conditions of access are under negotiation. Agreements reached by the Parties at this stage include:   1. CISRO will remain the owner of the tool, including the improvements generated under this project; 2. CIMMYT will have the right to use and disseminate ADOPT according to the terms and conditions that are yet to be agreed. In negotiating those, CIMMYT will include obligations towards ACIAR to Fund this project.   Datasets generated with ADOP will also be made available to the project partners and will be disseminated as described below. |
| Provider based in Mexico, applicable to all target countries | CIMMYT and partners will generate new data and make it available. Background IP in the form of data, generated in previous phases of this project, as well as in other projects will also be made available. |

#### Other agreements

|  |  |  |
| --- | --- | --- |
| Is any aspect of the project work subject to, or dependent upon: | Yes | No |
| other materials-transfer agreements entered into by any project participant? |  | X |
| confidentiality agreements entered into by any project participant? |  | X |

If "yes" to any of the above, for each applicable country provide:

brief details of the agreements and conditions

a copy of any such agreement before project commencement.

|  |  |
| --- | --- |
| Country | Details of other agreements |
|  |  |

## Foreground, background and third party Intellectual Property

This includes, but is not limited to patents held or applied for in Australia and/or in partner countries and/or in third countries. For example, Foreground IP includes any new germplasm, reagents (such as vectors, probes, antibodies, vaccines) or software that will be developed by the project and any data that is created under the Project that will be reduced to a material form.

#### Foreground IP (IP that is expected to be developed during the project)

Ownership of or rights to Foreground IP other than as detailed in the ACIAR Standard Conditions must be approved by ACIAR.

|  |  |  |
| --- | --- | --- |
|  | Yes | No |
| Is it expected that there will be Foreground IP? | X |  |

If "yes", for each applicable country provide brief details of the IP and who will have rights to use the IP (e.g. Commissioned Organisation, Australian collaborating organisation/s partner countries).

If “yes” for data, for each applicable country provide brief details of any data reduced to a material form that could constitute Foreground IP and who will have rights to use the data (e.g. Commissioned Organisation, Australian collaborating organisation/s partner countries).

If a patent, give details of patent status (provisional, application, granted), priority date and designated countries.

|  |  |
| --- | --- |
| Country | Details of foreground IP |
| Australia | Terms and conditions to use Foreground consisting of improvements to ADOP software are still under discussion with ADOPT owner (CISRO). Such agreement will incorporate requirements according to “Standard Conditions for Project Agreements between the Commonwealth of Australia represented by the Australian Centre for International Agricultural Research and the Commissioned Organisation (International Centre)” above. |
| All countries | From all partners: knowledge and information on socio-economics, geophysical, agribusiness, conservation agriculture and modelling of targeted farming systems, and value chains (including market instruments, technology evaluation and risk management mechanisms for farmer-based production systems); policies; training approaches and materials will be made available to all partners and to target users in South Asia through access to a project database and web site.  Further, IRRI and CIMMYT commit to the sustainable maintenance and upgrading of the Crop Manager framework to maximize the access to end users of the decision support tools generated through CSISA and other CIMMYT managed project in the region. |

#### Background IP (IP that is necessary for the success of the project but that has already been created and is owned by parties to the project)

Any agreements in place regarding Background IP including any data that is brought to a Project by a Party that will be used for the purposes of the Project and the creation of Foreground IP should be provided to ACIAR prior to project commencement.

|  |  |  |
| --- | --- | --- |
|  | Yes | No |
| Is it there Background IP? | X |  |
| If “yes”,  are there any restrictions on the project's ability to use the Background IP? |  | X |
| would there be any restriction on ACIAR or the overseas collaborator claiming their rights to IP for the project based on the Background IP (refer ACIAR Standard Conditions)? |  | X |

If "yes", for each applicable country provide brief details of: the source of the Background IP; whether the Commissioned Organisation and/or Australian collaborators and/or developing country collaborators own it; any conditions or restrictions on its use.

|  |  |
| --- | --- |
| Country | Details of background IP |
| Australia | ADOPT software will be provided by CISRO. Based on the current discussions for its use in the project, CIMMYT does not envision restrictions that affect the project implementation. CIMMYT does not expect either any restriction associated with the incorporation of Background IP, to access and use IP that contradicts standard conditions for International Centers (IARC). |
| Mexico | CIMMYT’s prototypes on CA machinery (developed in different projects, independently of this one) are licensed by CIMMYT free of charge to small-medium local machine manufacturers. Those manufacturers reproduce the prototypes and are able to commercialize them, or provide a service to farmers with them (at a reasonable fee). During the project, this prototypes will be evaluated by farmers, project partners, machinery manufacturers, and other interested parties. Any information generated through such evaluations will be shared with all the participants. The gathered and shared information could be used for further improvements on the prototypes by any SRFSI project partner including CIMMYT and commercial machinery manufacturers. CIMMYT does not expect any restriction associated with the incorporation of Background IP, to access and use IP that contradicts standard conditions for International Centers (IARC) |
| South Asia | CIMMYT and partners will be providing datasets generated in previous phases of this project and produced independently, in other projects.  CIMMYT does not expect either any restriction associated with the incorporation of Background IP, to access and use IP that contradicts standard conditions for International Centers (IARC). |

#### Third Party IP (IP that is owned by or licensed from other parties)

Agreements governing the use of third party IP can be related to research materials, research equipment or machinery, techniques or processes, software, information and databases.

|  |  |  |
| --- | --- | --- |
|  | Yes | No |
| Is there any relevant Third Party IP that is essential to the project? | X |  |
| If “yes”, would there be any restriction on ACIAR claiming its rights to IP for the project (refer ACIAR Standard Conditions)? |  | X |

If "yes", for each applicable country provide brief details of: the source of the Third Party IP; the applicable country/ies; the circumstances/agreement/arrangement under which the IP is to be obtained or used by the project partners (for example, material transfer agreement, germplasm acquisition agreement, confidentiality agreement, research agreement or other arrangements); any conditions or restrictions on its use.

|  |  |
| --- | --- |
| Country | Details of third party IP |
| Australia | Information about ADOP software is included in the first section of this document (proprietary materials), as well as in Background IP. |

#### Other contracts, licences or legal arrangements

|  |  |  |
| --- | --- | --- |
|  | Yes | No |
| Are there any other contracts, licences or other legal arrangements that relate to the project? |  | X |

If "yes", for each applicable country provide brief details.

|  |  |
| --- | --- |
| Country | Details of other contracts, licences or legal arrangements |
|  |  |

# Appendix B: CASI innovations promoted through SRFSI

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Technologies / practices** | **Current Phase of SRFSI (2016-18)** | **Possible future** | **Target Country / Locations** | **Remarks** |
| **1** | **Larger scales demonstrations -Zero/Strip technologies for cereals and legumes** | \* | \*\* | ZT – India and Nepal;  ST - Bangladesh | Mechanised based crop intensification is at the heart of SRFSI. We will continue the work on priority considering existing / available resources until 2018. Service provision model will continue as priority activity encouraging women farmers to become service providers.  The “Service Provision through private sector” model may become of topic for further research on policies in the next phase of DFAT investment under SDIP. |
| a. ZT Wheat | \* | \*\* | India, Nepal |
| b. ST Wheat | \* | \*\* | Bangladesh |
| c. ZT Maize | \* | \*\* | India, Nepal |
| d. ST Maize | \* | \*\* | Bangladesh |
| e. Legumes (Lentils, Rajma beans, etc.) | \* | \*\* | Bangladesh, Nepal and India |
| **2** | **Intercropping** |  |  |  | Based on suitability of technology/ies and market niche leafy vegetables will be promoted. Help for nutrition security as well. |
| a. Maize + leafy vegetables | \* | \* | Bangladesh, Nepal and India |
| b. Maize + beans | \* | \* | Bangladesh, Nepal and India |
| **3** | **Fertilizer management** |  |  |  | Scalable Nutrient Manager for rice, maize and wheat will be promoted through NARES. Rationale use of fertilizer based on NARS recommendation advocated. |
| a. Rice | \*\* | \* | Bangladesh, Nepal and India |
| a. Maize | \*\* | \* | Bangladesh, Nepal and India |
| b. Wheat | \*\* | \* | Bangladesh, Nepal and India |
| c. Lentil | \* | \* | Bangladesh, Nepal and India |  |
| 4 | **Weed managements (Rice, Maize and Wheat)** | \* | \*\* |  |  |
| 5 | **Seed systems** |  |  |  | Early to medium maturing, stress tolerant systems compatible rice, wheat, lentil varieties considering production niches will be multiplied and distributed. This is one of the best ways to reach majority of the unreached. Project will promote community based seed production and marketing by enhancing entrepreneurial skills of farmers/traders. |
| a. Rice | \*\* | \* | Bangladesh, Nepal and India |
| b. Wheat | \*\* | \* | Bangladesh, Nepal and India |
| c. Lentil (+legumes) | \*\* | \* | Bangladesh, Nepal and India |
| 6 | **Training/Capacity building** |  |  |  | This is the core of variation 3. Train more professionals so that they will in turn organise training to stakeholders including farmers. Training modules prepared by CIMMYT/CSISA will be used. More emphasis will be given to Micro-enterprise development and explore the possibility of more investment from private sector. |
| a. ToT on CA based crop management – partners staff | \*\* | \* |  |
| b. Farmers training on CA and weed management | \*\* | \*\* |  |
| c. ToT on seed system – partners staff | \*\* | \*\* |  |
| d. Farmers training on quality seed production and marketing | \*\* | \*\* |  |
| e. Micro-enterprise and entrepreneurial skill development | \*\* | \*\* |  |
| **7** | **Linkage Development / Publications/ Communication** |  |  |  | Work will continue with the existing development partners and expand to new partners – particularly the private sector for small/micro-enterprise development. Based on target audiences, various types of events and dissemination materials will be produced. Women farmers’ meaningful participation will be supported while implementing events, by making sure obstacles to their participation are removed. Dissemination and communication materials will be based on base SRFSI (plus..) findings. |
| a. Linkage development and partnership workshops / meetings, etc. | \* | \*\* |  |
| b. Field days | \*\* | \*\* |  |
| c. Exchange visits (farmers) | \* | \*\* |  |
| d. Focus group discussion on various purposes | \*\* | \* |  |
| e. Success stories production and dissemination | \*\* | \* |  |
| f. ICT based communication/radio/video and TV program | \*\* | \* |  |
| g. Annual review and planning meeting | \* | \* |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

Note:

\*Continue with the existing resources with targeted approach to include gender, poverty and profitability, disaggregated data like gender, poverty, etc. will be collected/reported;

\*\*Greater emphasis/Priority focus, taken more seriously and implemented aggressively

All activities would be designed and conducted with a systems perspectives. SRFSI believes on togetherness, it will collaborate with CIMMYT’s, ACIAR’s and DFAT’s other regional projects for better synergy and to achieve the envisioned targets.

# Appendix C: Critical linkages for scaling

In general, as indicated in the institutional analysis conducted for SRFSI by the Centre for Research on Innovation and Science Policy (CRISP), the coordination and communication between the central players for SRFSI’s scaling, in India, Nepal and Bangladesh, which are distributed across the public, civic and private sectors, is generally weak. Shortcomings common to the public sectors of India, Nepal and Bangladesh include the top-down and disciplinary approach to planning and implementation among government agencies, and the small number of front-line extension officers with limited technical expertise. To address such weaknesses, linkages need to be built with and between the following nine types of organizational actors which are distributed across the public, civic and private sectors:

1. **National and state departments of agriculture and extension** implement schemes (distribution of subsidies, training, demonstrations and advice), for example the West Bengal state promotes CASI innovations on a large scale. These schemes align with SRFSI’s objectives but reach only a minority of farmers due to financial and human resource constraints, as well as limited partnerships with actors more capable of outreach to large numbers of farmers;
2. **Irrigation and water resource development departments and agencies** develop and manage tube wells and canal irrigation systems but are poorly aligned with public sector extension agencies;
3. **Universities and research centres** develop and adapt agricultural technologies but some may have a limited ability to scale them out due to poor linkages with, and accountability to, extension agents;
4. **Panchayet Raj Institutions (PRI)** (called Village Development Committees [VDC] in Nepal) are the form that local government takes in all three countries and are pivotal to the implementation of agricultural policies and programs at the village level;
5. **NGOs** undertake community mobilisation, technology validation and promotion, and have an important extension role that is not widely recognised, partly because locally-oriented NGOs have generally limited geographical reach and poor technical knowledge;
6. **Agribusinesses** are engaged in input and output marketing, and in the case of Nepal, are poorly regulated by the public sector. They are mostly located in district headquarters, with little presence in VDCs and at the local level;
7. **Manufacturers/servicers of CA equipment** are strong in India andexist to some extent in Bangladesh. In India most of the machinery is manufactured in the north-western region and concentrates on equipment for 4-wheel tractors, whereas in Bangladesh the industry is concentrated near to the capital, Dhaka, and concentrates on equipment for 2-wheel tractors.
8. **Rural financial institutions** are a source of funding for CA equipment for existing formal groups of farmers. Rural banks such as NABARD and Yes Bank a range of programs that can assist formal farmer groups to access credit to make it easier to purchase CA equipment.
9. **Prime Minister Agriculture Modernization Project in Nepal,** where agricultural mechanization and seed systems will be the strong component. The SRFSI will seek opportunities to closely work with the project for CASI technology validation and promotion at scale.

Under the variation 3, existing linkages will be amplified to include strategic alignment with as many organizations as possible through the Innovation Platforms and other forums.

# Appendix D: Innovation platforms

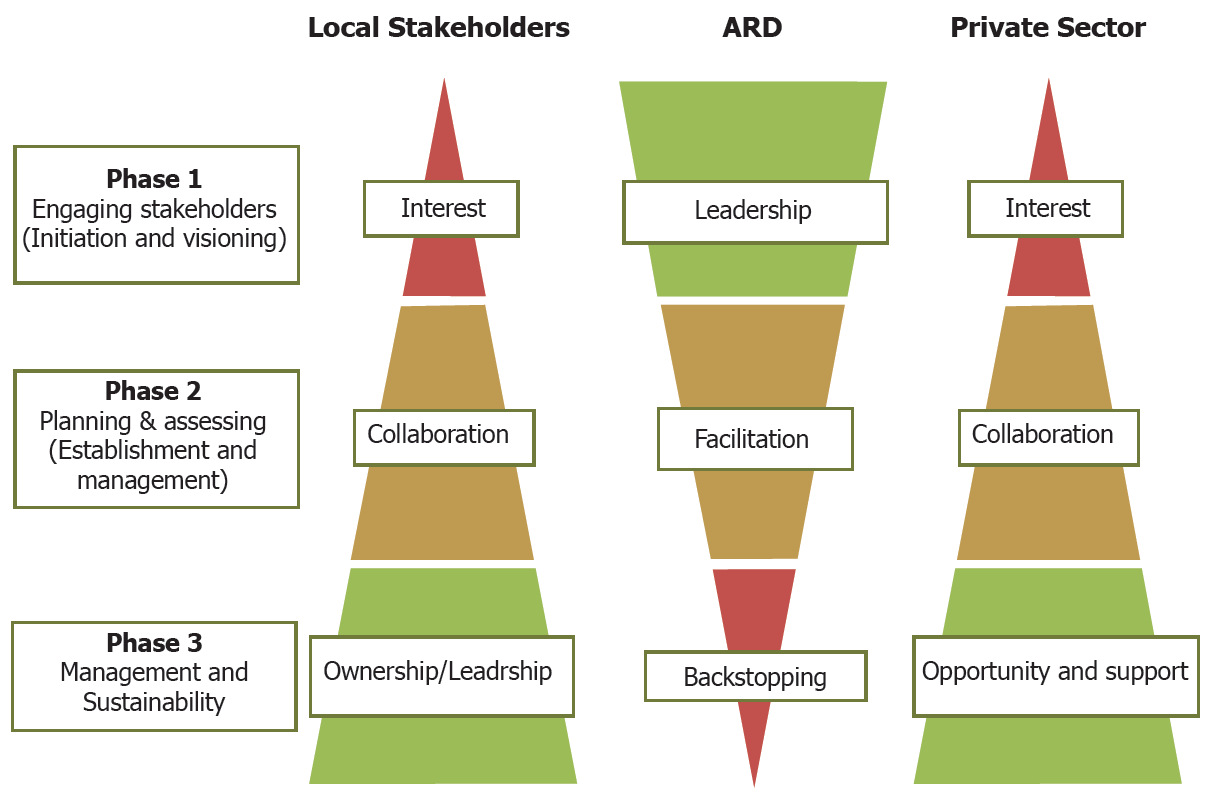
## 9.1 Innovation platforms at three levels

Supporting Innovation Platforms and other multi-stakeholder vehicles to stimulate technological and institutional change leading to livelihood improvements for vulnerable farming households will be fundamental to achieving scaling impacts. These Innovation Platforms will support testing, adaptation and promotion of a wide range of technical and institutional innovations. Two levels of actors and decision making processes through multi-stakeholder forums will be linked by utilising existing groups and networks and at the local and district levels. This will ultimately link with Innovation Platforms and other forums at higher levels through the SDIP 2 program and also link with the policy issues SRA (IFPRI/ANU).

**Box 1: Multistakeholder Platforms (IPs) in SFRSI**

Multistakeholder (or Innovation) Platforms (IPs) have proven to be a successful methodology for linking private, civil and public sector stakeholders to collectively identify and work towards overcoming barriers to improving agricultural productivity (Boogaard et al. 2013; Davies et al. 2015; ILRI 2013; Makini et al. 2013; Nererlof et al. 2011; Swaans et al. 2013). In the earlier phase of the SRFSI project, some of the problems discussed and collaboratively addressed (at least partially) through innovation platforms include limited availability of quality fertilisers, herbicides and seeds at the right time, limited availability of machinery and lack of skills for repair and maintenance and limited technical knowledge and skills on crop management practices. IPs have also facilitated integration of food production with energy and water management considerations at a local level where interest is driven by the practical solutions offered by SRFSI to overcome labour, energy and water shortages.

The Figure below shows at what stage the SFRSI is intervening and how that changes over time. Under variation 3 we want to take up only a backstopping role.

*Source: Figure 2 of KARI/ACIAR Guide (Adapted from Devaux, A, Ordinola, M., Manrique, K, Lopez, G. and Thiele, G. Stimulating pro-poor innovation within market chains of native potato: The case of Peru*

The likely administrative level at which the multi-stakeholder forums function will be at the community, inter-village and ‘Block’-level (in the Indian districts), and its equivalent Upzila in the Bangladeshi and Nepalese Districts. District level forums will focus on commercial and public administration decision-making regarding service provision to farmers. Ultimately these multi-stakeholder forums will also address the regional (e.g. an Indian State, the Terai plain region) or national level.

Potential organisations from which members of forums in the current eight SRFSI Districts can be drawn are listed in Section 9.2. Effective local stakeholder and network analyses will continue to be conducted during the ongoing constitution of the multi-stakeholder forums, and will include development of criteria for selecting key participants. The plan is to expand these to new communities and Districts in neighbouring areas.

#### Local Innovation Platforms

Local Innovation Platforms and other multi-stakeholder forums form a critical foundation informing the higher level innovation systems effort. Highly participatory methods to actively encourage upstream participation of farmers and farmer groups in innovation decision making, will:

* encourage farmer input into, and ownership of, innovation processes;
* stimulate the adaptation and adoption of technological change;
* identify and develop technologies that are more likely to meet the needs of farmers;
* facilitate farmer to farmer extension
* identify impediments to technology adoption and farm productivity;
* pursue aggregated input purchase and produce sale arrangements; and
* build ‘social capital’ within and between local farmer groups and other innovation parties.

Local level scaling out requires that partnerships are built with other key stakeholders operating at the village and inter-village level, including panchayets and VDCs, local NGOs, agribusiness, farmer groups, and other local projects that can be invited to participate in multi-stakeholder forums with existing farmer groups or networks. This also entails the establishment of strong supply chain networks by building the capacity of private sector agro-enterprises and micro-entrepreneurs, for example, by business skills training and linking them to financial institutions. Skilled institutional facilitators to help ensure that partnerships are forged and collaboration commenced with a strong focus on innovation and improvement to farmer livelihoods, and that partners contribute on the basis of comparative advantage and interest. Existing forums will be maintained where existing Nodes (communities) are highly successful, and will expand to neighbouring communities.

Local multi-stakeholder forums will likely include the following partners:

* farmer and self-help groups and cooperatives (using existing formalised groups and networks as much as possible)
* Panchayet/VDC staff involved in administering agricultural schemes
* local researchers and project staff
* business and ICT hubs
* local NGOs and their social mobilisation/extension staff
* local agribusinesses (machinery service providers, local sellers of inputs, credit providers; produce buyers; produce transporters etc.)
* institutional facilitators drawn from among the staff of extension agencies, NGOs, research organizations or agribusiness staff)

#### District Innovation Platforms

Innovation Platforms and other multi-stakeholder forums will operate at district level where commercial and public administration decisions are made regarding service provision to farmers and have the following roles and intended outcomes:

* strong leadership in innovation brokerage for higher level knowledge co-creation and co-learning;
* strong representation of farmer representatives
* engage with agri-business actors at the district level, e.g. aggregators and processors;
* partner with district-level stakeholders and staff involved in designing and administering agricultural schemes;
* influence policy within organisations that are key to scaling up;
* assist with the establishment of Innovation Platforms and other multi-stakeholder forums and activities in further villages and districts (key for scaling out to neighbouring areas).

District Innovation Platforms will likely include the following partners:

* research and extension representatives from the local IPs and other multi-stakeholder forums
* government extension staff
* researchers and other project partners operating at the District level and higher, and linking to existing projects and initiatives
* peak District or regional NGOs
* District, regional or national agribusiness (sellers of inputs and machinery; credit providers; produce buyers; produce transporters etc.) and expansion of agro-enterprises at local level in non-nodal VDCs

We aim to continue with existing District level Innovation Platforms (in 8 Districts) where they are highly effective, but also expand multi-stakeholder forums to neighbouring Districts so that we have Innovation Platforms and other multi-stakeholder running in a total of 16 Districts.

#### Regional Innovation Platforms:

Eventually, innovation platforms will also operate at the level of each of the three national regions of the EGP. The role of these platforms is clearly that of up-scaling in order to achieve further out-scaling i.e. influencing high-level organisational and institutional policies and behaviours, but with a clear focus on achieving impacts through technological change and livelihood improvement at farmer community and household levels.

Level 3 up-scaling platforms will likely include the following partners:

* regional and national-level government organisations;
* regional and national NGOs/peak groups;
* regional, national and international agribusiness and Corporate Social Responsibility fund managers;
* regional and national R&D project implementers;

initially SRFSI partners as facilitators and eventually trained institutional facilitators.

## 9.2 Potential Innovation System Organizations in the 8 SRFSI Districts

Tables 1 to 7 below illustrate potential multi-stakeholder forum actors in the eight SRFSI Districts in India, Nepal and Bangladesh, extracted from studies conducted by Centre for Research on Innovation and Science Policy, Hyderabad (CRISP) in India and Bangladesh; and CRISP and the South Asia Institute for Advanced Studies, Kathmandu (SIAS) in Nepal.

**Table 1: Actors and their roles in Malda District, West Bengal (CRISP)**

**Table 2: Actors and their roles in Cooch Behar, West Bengal (CRISP)**

**Table 3: Actors and their roles Purnea District, Bihar, India (CRISP) - will be determined to shift after discussing with CSISA/CIMMYT.**

**Table 4: Actors and their roles in Madhubani, Bihar, India (CRISP) – will be determined to shift after discussing with CSISA/CIMMYT.**

**Table 5: Agriculture organizations and their categories in Dhanusha District, Nepal (SIAS & CRISP)**

**Table 6: Agriculture organizations and their categories in Sunsari District, Nepal (SIAS & CRISP)**

**Table 7: Actors and their roles Rajshahi and Rangpur Districts, Bangladesh (CRISP)**

**Table 1: Actors and their roles in Malda District, West Bengal (sources: CRISP 2013; UBKV 2014)**

|  |  |  |  |
| --- | --- | --- | --- |
| Sl No | Actors# | Main role | Interventions relevant for SRFSI activities related to uptake of agricultural technologies (especially priorities related to CA and WM) |
| 1. | State Department of Agriculture  (DoA) | Implementation of central and state schemes for agricultural development including national programme such as RKVY, NFSM and BGREI. Promotion of new technologies through demonstrations, trainings, field visits and distribution of select inputs (mainly seeds) and subsidized implements (mainly power tiller) are part of these programmes. | Promotion of zero till in wheat, mustard and jute through demonstration on government farms and subsidy of Rs 20,000 (cost of Rs 45,000);  Boro rice demonstration in Rabi;  Distribution of pump sets (with subsidy);  Promotion of SRI in hybrid Rice |
| 2 | Agricultural Technology Management Agency (ATMA), Malda | Organise training, exposure visits, kisan melas, farmer scientist interface, demonstrations; support to KVKs for technology assessment and refinement | 50 demonstrations planned for zero tillage and DSR in 2014-15 ;  Small size demonstration on IPM;  Farmer training |
| 3 | Krishi Vigyan Kendra (KVK) under UBKV, located at Ratua | It has the mandate of imparting vocational training to the practicing farmers including, farm women, youth and extension functionaries in improved technologies in the field of agriculture, animal husbandry, fisheries and other allied enterprises.  It is also vested with testing and refining the developed technologies and also to conduct front line demonstrations of new technologies in the farmer's field. | Zero tillage of Wheat demonstration with 350 farmers in 2013-14.;  4 ZT machines with KVK;  Introduction of DSR and SRI for water management through FLD and OFTs;  Crop diversification and Black gram cultivation under NICRA (National Initiative on Climate Resilient Agriculture) project;  Awareness generation on high arsenic content in water in Malda |
| 4 | Regional Research Sub Station, Old Alluvial Zone, UBKV Mathurapur, Manikchak, Malda | Basic, adaptive and need based zone specific research, Innovation / modification of eco-friendly technology specific to this zone. Selection and preservation of plant genetic materials/resources. Production and distribution of quality seed for the farmer of this zone. Extension of advance technology and motivation to the farming community through training and demonstration. Intercropping under orchard system, sericulture, quality mango production technique, arsenic problem, post-harvest technologies, pest-disease management | Implementing partner in SRFSI in Malda;  3 zero till machines with RRS. Trials in 70 acres of land under 5 Farmer Clubs in three blocks for promotion of cultivation of wheat, mustard, lentil through Zero till following principles of Randomised controlled trials  Replacement of variety  Water management (promoting efficient use of water viz a viz flooding)  Residue management  Nutrient management  3 wheat varieties being tested for heat tolerance  10 varieties of Maize tested in farm schools in CA system |
| 5 | Farmers Clubs (189)  100 of these are active | Emerging role as facilitator for transfer of technology, propagation of seed village concept, strengthen agricultural extension services, undertake collective purchase and distribution of inputs, production and marketing, capacity building of members, to act as Business Facilitators,  Business Correspondents for banks, formation of Self Help Groups (SHGs), Joint Liability Groups (JLGs), Producers Groups/Companies, Federations of Farmers’ Clubs, and assume the role of a leader. | 5 farmer clubs involved in Zero tillage training and demonstration with UBKV and  Trials in ZT wheat, lentil, mustard, Dibbling in maize  Seed production (lentil, maize):  1. Manikchawk Farmers Club, Manikchawk  2. Gourangapur Farmers Club, Gourangapur, Gazole  3. Vivekananda Krishak Sangha, Kalinagar, Gazole  4. Mahadipur Farmers Club, Mahadipur, Chanchal II  5. Sabuj Bahini Farmers Club, Vidyanandapur, Chanchal II |
| 6 | Machinery Suppliers (2 main supplier, 40-50 retailers) | Wholesalers/ Distributors for companies like Aspee, Camco(power tiller), Greaves cotton(mini combined harvester)  Star Agro Industries Pvt Ltd. Domohoni, Uttar Dinajpur | Provide farm implements to farmers and retailers  Manufacturing companies organize seminars/farmer meetings to promote new products with the dealers  Free service points to farmers |
| 7 | Private Input dealers | At the district, block and village levels. (2000  Wholesalers are registered with DoA).  Agro input dealers association in Malda  Tarakeshwar Roy (input distributer), Harishchandrapur | Main source of farm inputs and quite often the first point of advice on use of pesticides  Extend credit to farmers on farm inputs  Manufacturing companies organize seminars/farmer meetings to promote new products with the dealers |
| 8 | Market intermediaries | Commission agents and traders involved in sale of farm outputs |  |
| 9 | AIMKS  All India Manab Kalyan Society, Village Mathurapur, Manikchak, Malda | NGO working in Malda since 2012 for establishment and empowerment of CBOs for sustainable development.  Entrepreneurship development at grassroots through Farmer Clubs  Advocacy of programmes and schemes | Seed production with farmer clubs  Work closely with 200 SHGs, 5 Farmer Clubs and 11 Gram Panchayats of Malda Demonstration of CA based farming in wheat, mustard and lentil through farmer clubs |
| 10 | Local NGOs: RCHSS  Rajadighi Community Health service Society, Village Eklakhi, Gazole; Rajadighi, Malda. | Capacity building and empowerment of communities for sustainable development through SHGs;  Awareness building on Sustainable agriculture through meetings, trainings, booklets, etc.;  Advocacy on gender and legal aid through meetings, trainings, rallies, etc. | 842 SHGs with RCHSS  SRI promotion  Vermi-compost  Community granaries for preserving native varieties of seeds  Re excavation of ponds  Crop diversification (promotion of millets and pigeon pea) |
| 11 | National Bank for Agriculture and Rural Development NABARD | Preparation of potential link credit plan of the district presented to the state level banking committee:  Organisational development of banks;  Link between Farmers and Banks  Support formation of SHGs, Farmer Clubs and Joint Liability Groups  Through Grameen bhandaran yojana, NABARD has created rural godowns(100); RIDF caters to creation of road, market yard, local haat, godowns, cold storage through loan cum grant programmes | RIDF scheme mainly centered on projects of irrigation.  Farm mechanization programme promoting power tillers, threshers and tractors  Plan for setting up agricultural hubs for custom hiring of implements  Demonstration of SRI through PACS, Farmers’ clubs, NGOs |
| 12 | Panchayat | Implements several rural development programmes aimed at rural infrastructure development (rural roads, water harvesting structures such as ponds) and employment generation | Construction of water harvesting structures |
| 13 | Department of Water Resources | Agencies involved in canal irrigation, lift irrigation, minor irrigation canal area development | Maximum coverage of irrigation in the district through Shallow tube wells (33,279 as per the potential link plan of NABARD dated 31.03.2008)  Increasing irrigation potential through ADMI (Accelerated Development of minor irrigation)  Repair and construction of ponds/water harvesting structures |
| 14 | ICT initiatives | National Portal (NP) for Kissan Mobile Advisory Service to 1000  Sanction of Community Radio to KVK Ratua. (Yet to be functional) | Messages sent by KVK to NP on farm advisory |
| 15 | Credit agencies  Banks  PACS  16 Commercial banks; 98 branches | Credit linkages with farmers for purchase of inputs, machinery and availing subsidies  PACS: Credit linkages to small farmers |  |

**Table 2: Actors and their roles in Cooch Behar, West Bengal (CRISP 2013; UBKV 2014)**

|  |  |  |  |
| --- | --- | --- | --- |
| Sl No | Actors# | Main role | Interventions relevant for SRFSI activities related to uptake of agricultural technologies (especially priorities related to CA and WM) |
| 1. | State Department of Agriculture  (DoA) | Implementation of central and state schemes for agricultural development including national programme such as RKVY, NFSM and Jute mini mission II. Promotion of new technologies through demonstrations, trainings, field visits and distribution of select inputs (mainly seeds) and subsidized implements (mainly power tiller) are part of these programmes.  Subsidy up to Rs 45,000 under FSSM (Financial Support Scheme for Farm Mechanization)  9 weather stations, 2 automatic weather stations | Promotion of zero till through demonstration in wheat (5-6 machines), on government farms and subsidy of Rs 20,000(cost of Rs 45,000)  Boro rice demonstration in Rabi  Distribution of pump sets (with subsidy)  Promotion of SRI in hybrid Rice  Promoting power tiller, zero tillage machine under FSSM |
| 2 | Agricultural Technology Management Agency (ATMA) Cooch Behar | Organise training, exposure visits, kisan melas, farmer scientist interface, demonstrations; support to KVKs for technology assessment and refinement | Fund flow for ATMA to renew from 2014-15. Would comprehensively plan for training of farmers |
| 3 | Krishi Vigyan Kendra (KVK) under UBKV, Pundibari | To conduct ‘On farm testing’ for identifying technologies in terms of location specific sustainable land use system.  To organize trainings to update the extension personnel with emerging advance in Agriculture Research on regular basis.  To organize short and long term vocational training courses in agriculture and allied vocations for the farmers and rural youths with emphasis on ‘learning by doing’ for higher production on farmers and generating self-employment.  To organize Front line demonstration (FLD) on various crops to generate production date and feedback information. | Zero tillage in Wheat through demonstration.  3-5 ZT machines with KVK.  Introduction of raised bed planting and SRI in Boro Rice for water management through FLD and OFTs  15-20 ponds renovated under NICRA (National Initiative on Climate Resilient Agriculture) project  Residue management-compost &vermin compost  Trying to promote Entrepreneurship development in farmers |
| 4 | Uttar Banga Krishi Viswavidyalaya (UBKV), Cooch Behar | Research: 5 Co-ordinated Research Projects in Kalimpong and Cooch Behar under UBKV (under All India Co-ordinated Research Project on Wheat and Barley)  Ad-hoc research projects under NAIP, RKVY, Resource Conservation and Utilization (ICAR & Ministry of Water Resources, GOI), etc.  Production of breeder/foundation seed of HYVs of major field crops  Promotion of service providers to promote farm mechanization | Varietal improvement towards developing late sown, rain-fed disease tolerant varieties of wheat under CRP  >450 farmers in district have been trained in aspects of CA, >200 ha in wheat and 70 ha in maize under ZT; Three year programme on Promotion and conservation agriculture as a new enterprise for sustainability of production system and resource conservation under RKVY (2008-09 onwards) preceded by RWC project on CA 2006 onwards  Site specific nutrient management in lead cropping system in North Bengal funded by GoWB  Farmers training on participatory seed production  Innovating to develop prototypes for 2 wheel tractor run machinery relevant to local conditions  Promotion of Zero tillage wheat, lentil, mustard and maize |
| 5 | Farmers Clubs (600) of which 200 active) | Emerging role as facilitator for transfer of technology,  propagation of seed village concept, strengthen agricultural extension services,  undertake collective purchase and distribution of inputs,  production and marketing,  capacity building of members, to act as Business Facilitators, Business Correspondents for banks, formation of Self Help Groups (SHGs), Joint Liability Groups (JLGs), Producers Groups/Companies, Federations of Farmers’ Clubs,  and assume the role of a leader. | Zero tillage training and demonstration with UBKV  Trials in ZT wheat, Dibbling in maize  Seed production (paddy, pulses) |
| 6 | Cooch Behar Farmers’ Club Association (600 Farmer Clubs) | Established in 2011  Guidance and Nurturing Farmer Clubs  Has block level farmer clubs associations in 6-7 blocks  Advocacy for Farmers Club with various departments and PRIs especially for KCC | 5 farmer clubs involved in Zero tillage training and demonstration with UBKV:  1. Sabujmitra Krishak Sangha, Durganagar, Dinhata  2. Mansai Sakti Sangha, Mansai, Tufanganj  3. G-Shree Farmers Club, Ghughumari  4. Farmers Club for Innovative Agriculture, Satmile  5. Pallyshree Farmers Club, Patchara  6. Morangabari Torsa Kishan Sangha, Coochbehar I |
| 7 | Machinery Suppliers | Wholesalers/ Distributors for companies like Aspee, Camco (power tiller), Greaves cotton (mini combined harvester) | Provide farm implements to farmers and retailers  Manufacturing companies organize seminars/farmer meetings to promote new products with the dealers  Free service points to farmers |
| 8 | Private Input dealers | At the district, block and village levels. (1500 Wholesalers are registered with DoA).  Registered District Fertilizer & Agri Input dealers association in Cooch Behar having sub units in11 blocks | Main source of farm inputs and quite often the first point of advice on use of pesticides  Extend credit to farmers on farm inputs  Manufacturing companies organize seminars/farmer meetings to promote new products with the dealers |
| 9 | Market intermediaries  183 rural haats | Commission agents and traders involved in sale of farm outputs |  |
| 10 | Centre for the development of Human Initiatives (CDHI) Jalpaiguri | Community mobilization, building local capacity through Mistri Co-operatives, Gram Panchayats and SHGs  Facilitate and support NGOs on institution building  Networking & Liaising with GOs, NGOs and INGOs for establishing dialogue and linkages  Experimenting innovative designs for enhanced and improved irrigation facilities for farmers, scaling up successful designs  Participatory research | Developed and promoted Technological innovations in water use management by introduction of fuel-efficient pump sets, stone hammer (techniques in the non STW zone), bamboo filter strainer, etc.  Organized and promoted 25 Mistri (Mechanics) Co-operatives in the region;  SRI, WM and crop diversification promoted in farmer fields with Farmer clubs  >825 SHGs in Jalpaiguri and Cooch Behar |
| 11 | Local NGO: Satmile Satish Farmers’ Club “O” Pathagar, village chat elajan, cooch behar I, Cooch Behar | Initially formed in 1974, reoriented in 1995 with new members and vision. Started functioning in 2003 with promotion of SHGs. Linkage with UBKV/KVK in 2008  Implements hub established with NABARD, Loan cum grant programme  Promotion of SHGs  Networking  Training and capacity building of SHGs and Farmer Clubs | Promotion of Zero tillage in wheat; 1 village, 31 farmers  Dibbling in maize with 5 farmers  SRI (403 farmers), SWI(203 farmers) training and awareness through demonstrations  Seed village programme on paddy (kharif) in 4 villages, 120 farmers |
| 12 | Local NGO: Tufangani Anwesha Welfare Society (TAWS), Lambapara, Toofanganj, Coochbehar | Livelihood promotion of marginal farmers & tribal communities through land based activities  Social mobilization through formation of SHGs (198), Farmer Clubs (14), producer organisations (4)  Planning to set up implements hub | Promoting ZT in wheat, mustard, lentil through Farmers clubs with 12 farmers as partial trials  Seed (paddy, pulses) village programme with NABARD  Demonstration, training & capacity building on SRI |
| 13 | Local NGO: Gitaldah Bikas Samity, Dinhata II |  |  |
| 14 | National Bank for Agriculture and Rural Development NABARD >550 Farmers clubs  >2500 JLGs  >37,000 SHGs | Preparation of potential link credit plan of the district presented to the state level banking committee:  Organisational development of banks;  Link between Farmers and Banks  Support formation of SHGs, Farmer Clubs and Joint Liability Groups  Through Grameen bhandaran yojana, NABARD has created rural godowns(12); RIDF caters to creation of road, market yard, local haat, godowns, cold storage through loan cum grant programmes  Trying to promote producer organisations (PODF) | For promotion of Zero tillage 100 acres land in 1 block under FTTF (Farmers Technology Transfer Fund) for promotion of ZT  RIDF scheme mainly centered on projects of irrigation.  Farm mechanization programme promoting power tillers, threshers and tractors  1 agricultural implements hub set up for custom hiring of implements. Trying to set up 1 each in all the 12 blocks  Demonstration of SRI through PACS, Farmers’ clubs, NGOs |
| 15 | Panchayat | Implements several rural development programmes aimed at rural infrastructure development (rural roads, water harvesting structures such as ponds) and employment generation | Construction of water harvesting structures |
| 16 | Department of Water Resources | Agencies involved in canal irrigation, lift irrigation, minor irrigation canal area development | Maximum coverage of irrigation in the district through Shallow tube wells (39696 in 2005-06 as per the CDAP Cooch Behar)  Increasing irrigation potential through ADMI (Accelerated Development of minor irrigation)  Repair and construction of ponds/water harvesting structures  IWMP in Cooch Behar for soil and water conservation |
| 17 | ICT initiatives | National Portal (NP) for Kissan Mobile Advisory Service to  SMS based weather forecast to 5000 farmers  Ineffective Kissan Call center | Messages sent by KVK to NP on farm advisory  UBKV, KVK have an outreach to 5000 farmers on weather advisory |
| 18 | Credit agencies  Banks (141 branches)  PACS (184; 84 dormant) | Credit linkages with farmers for purchase of inputs, machinery and availing subsidies  PACS: Credit linkages to small farmers |  |

**Table 3: Actors and their roles Purnea District, Bihar, India (CRISP 2013)**

|  |  |  |  |
| --- | --- | --- | --- |
| Sl No | Actors# | Main role | Interventions relevant for SRFSI activities related to uptake of agricultural technologies (especially priorities related to CA and WM) |
| 1. | State Department of Agriculture  (DoA) | Implementation of central and state schemes for agricultural development including national programme such as RKVY, NFSM and BGREI. Promotion of new technologies through demonstrations, trainings, field visits and distribution of select inputs (mainly seeds) are part of these programmes | Promotion of zero till in wheat through demonstration, farm machinery fair and 50% subsidy  Summer moong demonstration  Boro rice demonstration  Distribution of pump sets (with subsidy)  Promotion of QPM (Quality Protein Maize) through demonstrations |
| 2 | Agricultural Technology Management Agency (ATMA), Purnea | Organise training, exposure visits, kisan melas, farmer scientist interface, demonstrations; support to KVKs for technology assessment and refinement | Themes/Topics are decided by the line departments and agencies who are part of the ATMA Management Committee/Block Technology Team/Farmer Advisory Committee |
| 3 | Department of Horticulture (DoH) | Implementation of schemes such as National Horticultural Mission, National Micro Irrigation Mission (sprinkler and drip for horticultural crops), Promotion of medicinal plant cultivation | Limited relevance as the activities focus mostly on horticultural crops |
| 4 | Krishi Vigyan Kendra (KVK) under Bihar Agricultural University, Sabour) located at the Regional Research Station for Groundnut,  Jalalgarh | Technology assessment and refinement; Training farmers and extension functionaries of line departments ; Undertaking on-farm farm trials and demonstrations in its 5 adopted villages;  Advisory support to callers on phone and those who seek advice by visiting KVKs;  Voice SMS advisory to registered farmers;  Seed production (sesame)  Information dissemination through kisan choupals (once a week) | Zero till demonstration (have one machine)  Training on entrepreneurship development |
| 5. | Bhola Prasad Shastri Agricultural College, Purnea (under Bihar Agricultural University, Sabour) | Teaching, research and training  Mobile based advisory service;  Attend Kisan Chaupals  Undertaking research on 15 themes/topics (on-going) | Seed Production of paddy and wheat  Evaluation of hybrid maize  Multi-locational trials of wheat  Nutrient trials –wheat and maize  Intensification/diversification of existing cropping system on cultivators field (wheat and maize) |
| 6 | JEEVIKA (Bihar Rural Livelihood Promotion Society) | Programme funded by the World Bank and Government of Bihar to enhance social and economic empowerment of the rural poor in Bihar. Objectives include: improving rural livelihoods, developing organizations of the rural poor and producers to enable them to access and better negotiate services, credit and assets from public and private sector agencies and financial institutions; investing in capacity building of public and private service providers; promoting development of microfinance and agribusiness sectors. Also implements the National Rural Livelihoods Mission (NRLM) in Bihar. | Promote agricultural development through capacity building of women SHGs and using trained Village Resource Persons (VRPs) to support rural women. |
| 7 | Women SHGs of Jeevika (15237) | Over 23,000 farm women households in Purnea engaged in cultivation of crops (mostly share croppers and lease hold farmers) who are formed into SHGs mainly for savings and credit and are part of several livelihood improvement programmes organized by Jeevika.  Agricultural interventions include promotion of vermin compost, vegetable garden, kitchen gardens, improving seed replacement rates through PVSP, Organise exposure visits and demonstrations | Promotion of SRI, SWI, SCI  Zero budget farming, crop diversification (maize and vegetables) and promotion of summer moong as third crop, promotion of weeders |
| 8. | Women Village Organisations (VOs) of Jeevika | 894 (till Dec 2013)  Apex body of SHGs at the village level; recruits the Village Resource Persons; manage funds for SHGs; purchase inputs for women SHGs through their procurement committee | Procurement of inputs (mainly seeds, pump sets for hiring) and managing training equipment  Village Resource Persons organize demonstrations and trainings to farmers and (they get trained by Jeevika) disseminate information, undertake farm visits (maintain a register), record observations, provide feedback and provide continuous hand holding |
| 9 | Private farm input dealers | At the district, block and village levels. (Wholesalers are registered with DoA). | Main source of farm inputs and quite often the first point of advice on use of pesticides  Manufacturing companies organize seminars/farmer meetings to promote new products with the dealers |
| 10 | Market intermediaries | Commission agents and traders involved in sale of farm outputs |  |
| 11 | Digital Green | Production of videos on agriculture in farmer fields in local dialect.  Acts as facilitators and trainers for knowledge dissemination through projecting these videos  Supply projectors  Work closely with Jeevika and train the VRPs on production of videos and handling of equipment | Acts as facilitators and trainers on use of vides for knowledge dissemination and training |
| 12 | National Bank for Agriculture and Rural Development NABARD, Commerical banks and PACS (Primary Area Co-operative Society) | NABARD: Preparation of potential link credit plan of the district presented to the state level banking committee:  Organisational development of banks;  Support formation of SHGs, Farmer Clubs and Joint Liability Groups  Through RIDF, NABARD has created rural godowns;  Banks: Credit linkages with farmers for purchase of inputs, machinery and availing subsidies  PACS: Credit linkages and supply of fertilizers wherever functional | Important source of farm credit. Small farmers and share croppers increasingly access informal credit obtained through local money lenders and also currently available through the SHGs. |
| 13 | Panchayat | Implements several rural development programmes aimed at rural infrastructure development (rural roads, water harvesting structures such as ponds) and employment generation | Construction of water harvesting structures |
| 14 | District Rural Development Agency | Distribution of Solar Pump sets |  |
| 15 | Department of Water Resources/Irrigation | Agencies involved in canal irrigation, lift irrigation, minor irrigation canal area development | 2-3 canals in Damdaha block, but no irrigation in Rabi season. |
| 16 | Rajkumar Agro Engineers Private Limited  Nagpur | One of the manufactures of zero drill equipment |  |
| 17 | ASA  (Action for Social Advancement) | NGO involved in rural livelihood promotion | Engaged in promotion of SWI, SRI, Participatory Varietal Selection, Farmer Field Schools and Agri-business promotion  Implements the *Mahila Kisan Sashaktikaran Pariyojana* in 3 Districts of Bihar (including Purnea) |
| 18 | Grameen Vikas Trust, Navratan Hatta, Purnea  District Project Office | Wasteland Agriculture Development Initiative.  Productive Utilization of wasteland and marginal lands, Increased area under fruit crops, reduced migration, Generation of self-employment for rural mass, Strengthened Community participation in decision making process. | Conservation of natural resource like water and soil  Project aimed at working with 550 HHs in the district |

**Table 4: Actors and their roles in Madhubani, Bihar, India (CRISP 2013; BAU, 2014)**

|  |  |  |  |
| --- | --- | --- | --- |
| Sl No | Actors# | Main role | Interventions relevant for SRFSI activities related to uptake of agricultural technologies (especially priorities related to CA and WM) |
| 1. | Department of Agriculture  (DoA) | Implementation of national and state schemes related to agricultural development. Some of the big programmes are RKVY, NFSM, BGREI.  Promotion of new technologies through demonstrations and kisan mela (once an year)  Distribution of seeds, promotion of HYV of rice (MT7029)  Subsidy on pump sets (15%) and STW(Rs 12,000)  Conducting Rabi-Kharif Mahotsav | Promotion of paddy transplanter and drum seeder in Rice, Zero till in wheat through demonstration and farm machinery fair.  Summer moong, Green manure demonstration  Boro rice demonstration  Finger millets demonstration  Distribution of pump sets (with subsidy)  Promotion of QPM through demonstrations |
| 2 | Agricultural Technology Management Agency (ATMA), Madhubani | Training, exposure visits, kisan melas, farmer scientist interface, demonstrations; support to KVKs for technology assessment and refinement | Themes/Topics are decided by the line departments and agencies  In 2013-14 one farmer trained on using zero till machine at ICAR –RCER (Research Complex for Eastern Region), Patna  26 farmers taken to Farm Science fair held at IARI, New Delhi on exposure visit |
| 3 | DoH | Implementation of schemes such as National Horticultural Mission, National Micro Irrigation Mission (sprinkler and drip for horticultural crops), Promotion of medicinal plant cultivation, promotion of mechanization in horticulture, INM, IPM and Organic farming | Construction of water harvesting structures in farmer fields with 95% subsidy till 2012-13. |
| 4 | KVK,  SK Chowdhary Educational Trust, Basaith, Village Chandpur, Madhubani | Resource and knowledge center at the district level of RAU, Pusa  Technology assessment and refinement, Training farmers, farmer clubs and extension functionaries of line departments, On farm trials and demonstrations in adopted villages  Advisory support to callers on phone and those who seek advice by visiting KVKs  Seed production  Kissan gosthis for information dissemination | Promoting hybrid seeds, green manure, vermin compost and cultivation of millets |
| 5 | Rice-Regional Research substation, Jhanjharpur Madhubani | Source of technical knowledge on rice in the district. |  |
| 6 | JEEVIKA | Programme funded by the World Bank, GoB to enhance social and economic empowerment of the rural poor in Bihar. Objectives include: improving rural livelihoods, developing organizations of the rural poor and producers to enable them to access and better negotiate services, credit and assets from public and private sector agencies and financial institutions; investing in capacity building of public and private service providers; promoting development of microfinance and agribusiness sectors. Also implements the National Rural Livelihoods Mission (NRLM). | Promotion of agricultural development through women SHGs and trained Village Resource Persons (VRPs)  Promotion of solar pump sets in pilot mode |
| 7 | Women SHGs of Jeevika (16185) | Mainly 22,892 farm women households engaged in cultivation of crops (mostly share croppers and lease hold farmers) who are formed into SHG mainly for savings and credit and are part of several livelihood improvement programmes organized by Jeevika.  Agricultural interventions include promotion of vermin compost, vegetable garden, kitchen gardens, improving seed replacement rates through PVSP, Organise exposure visits and demonstrations | Promotion of SRI, SWI, SCI  Zero budget farming, crop diversification (maize and vegetables) and promotion of summer moong as third crop, promotion of weeders |
| 8 | Women Village Organisations (VOs) of Jeevika | 887 (till March 2014)  Apex body of SHGs at the village level; recruits the Village Resource Persons; manage funds for SHGs; purchase inputs for women SHGs through their procurement committee | Procurement of inputs (mainly seeds, pump sets for hiring) managing training equipment  Village Resource Persons organize demonstrations and trainings to farmers and (they get trained by Jeevika) disseminate information, undertake farm visits (maintain a register), record observations, provide feedback and provide continuous hand holding |
| 9 | Private farm input dealers: | At the district, block and village levels. (100 Wholesalers are registered with DoA).  Work closely with the Area Sales Managers of Input companies  e.g.: Md. Safik,Hariali seed (opposite Madhubani treasury);Sushil Kumar Singh, SonalikaTraders. Mahila College Rd; Deepak Kumar, Har Govind seed court campus, Madhubani; Sanjay Chaudhary, Mesars krishna javik udyog, Madhubani. | Main source of farm inputs and quite often the first point of advice on use of pesticides |
| 10 | Market intermediaries | Commission agents and traders |  |
| 11 | Digital Green | Operates in 3 blocks  Production of videos on agriculture in farmer fields in local dialect.  Acts as facilitators and trainers for knowledge dissemination through projecting these videos Provide projectors  Work closely with Jeevika and train the VRPs on production of videos, handling of equipment | Acts as facilitators and trainers on use of vides for knowledge dissemination and training |
| 12 | National Bank for Agriculture and Rural Development NABARD,  Banks and PACS(Primary Agriculture Co-operative Society) | NABARD: Preparation of potential link credit plan (PLP) of the district presented to the state level banking committee: Organisational development of banks;  Through RIDF, NABARD tried to create rural godowns;  Formation of SHGs, Farmer Clubs (300) and Joint Liability Groups(1000)  NABARD is implementing Priyadarshini ‘WELP’ (Women Empowerment and Livelihood Programme) in two blocks.  Banks: 22 banks with 235 branches. Credit linkages with farmers for purchase of inputs, machinery and availing subsidies  PACS: Credit linkages and supply of fertilizers wherever functional | Central Bank of India, the lead bank of the districts has adopted 2 Gram Panchayats in the district to provide access to all welfare schemes and it has linkages with Jeevika programme in these two Gram Panchayats.  40% subsidy to farmers on boring and upsets that can irrigate a land of 2 acres and above (2012-13 through Bihar ground water irrigation scheme)  Plans to federate farmers clubs promoted by NABARD to facilitate production to market linkages |
| 13 | Panchayat | Implements several rural development programmes aimed at rural infrastructure development (rural roads, water harvesting structures such as ponds) and employment generation | Instrumental in constructing water harvesting structures |
| 14 | District Rural Development Agency | Distribution of Solar Pump sets |  |
| 15 | Department of Water Resources/Irrigation | Agencies involved in canal irrigation, lift irrigation, minor irrigation canal area development | Western kosi canal |
| 15 | Rajkumar Agro Engineers Private Limited  Nagpur; Raghavendra Thakur,Tirupati Tractor Pvt. Ltd R.K. College Rd, Madhubani. | Manufactures of zero drill |  |
| 16 | Sakhi | NGO involved in women and child development, promotion of livelihood with fisherwomen co-operatives  SHG formation for women from marginal communities  Promotion of solar pump sets  Staff strength of 60  Advocacy, gender sensitization training for women and communities for gender mainstreaming | Have experience in working in flood prone areas.  Promoting fisheries, water berries, etc. in flood prone areas of the district. |
| 17 | NGO Gramin Nav Nirman prayas, (block-Babubarhi)Madhubani |  |  |
| 18 | Farmer Interest Groups: | e.g.  1 Nanaur, Andhrathari 2 Mauaahi, babubarhi. |  |

**Table 5: Agriculture organizations and their categories in Dhanusha District, Nepal (SIAS and CRISP 2013, NARC 2014)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Category** | **Organization names** | | |
| Government Actors | Government Organization (Research and Extension)  District Agriculture Development Officer (DADO)  District Development Committee (DDC)  District Livestock Service Office  Agriculture Development Project-Janakpur  Regional Agriculture Training Center  Fisheries Development and Training Center  National Rice Research Program  Agriculture Research Station(NARC)  Community Groundwater Irrigation Sector Project  Division Irrigation Office | | |
| Civil society actors | INGOs:  IDE-Nepal  CARE Nepal (past) | NGOs:  Janaki Women Awareness Society;  FORWARD; Rural Reconstruction Nepal; UdyamBikash  Janakpur;TPSBA, Dhanusha; Sewa Samiti, Dhanusha. | Community Organizations and Farmers Organizations  MithalaJillaKrishakSamhuha  Cooperatives  Farmers Groups: Sambridhi Krishak Samuha, Sinorjodha; Radhemohan Krishak Samuha, Baniniya |
| Private sector actors | Private Sectors Input suppliers  Tractor Dealers(12 in numbers)  Rice-Wheat Dealers(8-10)  Pipe Dealer(5-6)  Agro-Vet(Wholsale94-5)  Agro-Vet(Retailers (100)  Bhudev Agrovet, Janakpur  Dahal Agrovet, Janakpu | | Credit Agencies (48)  Regional Agriculture Development Bank  GraminBikash Bank |

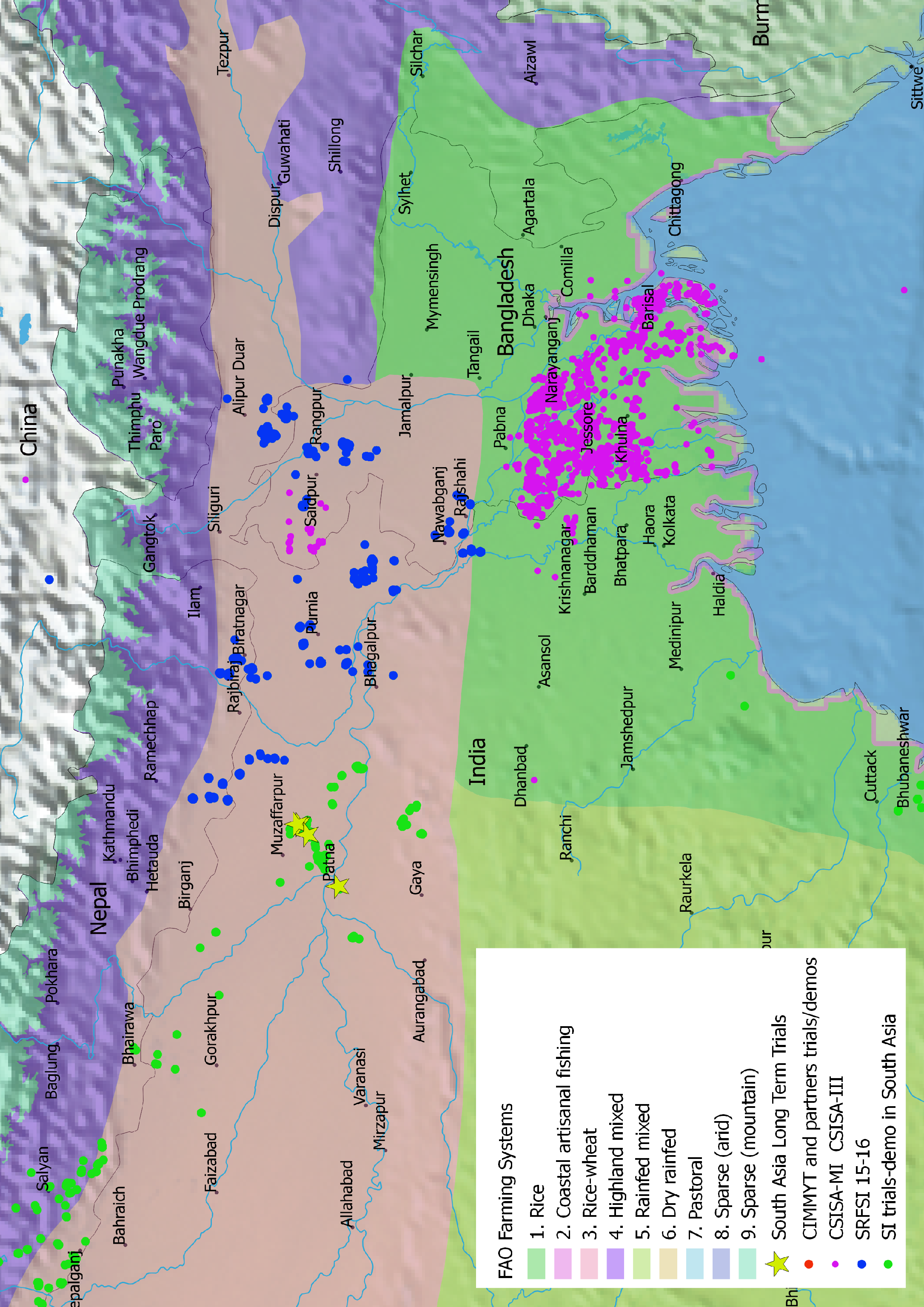
**Table 6: Agriculture organizations and their categories in Sunsari district (SIAS and CRISP)**

|  |  |  |  |
| --- | --- | --- | --- |
| Category | Organization names | | |
| Government Actors | Government Organization (Research and Extension)  District Agriculture Development Officer (DADO)  District Development Committee (DDC)  District Livestock Development Office  District Forest Office (DFO)  Cooperative Development and Training Division Office  Regional Agriculture Training Center  Regional Agriculture Research Center (NARC)  Sunsari Morang Irrigation Project (5)  Division Irrigation Office  Resham Farming Development Office  Jute Research Program  Regional Soil Test laboratory  Regional Seed Test laboratory  National Seed Company  Agri-input Company | | |
| Civil society actors | INGOs (Main: 3):  Plan Nepal  Word Vision Nepal  United Mission to Nepal | NGOs (1174; prominent 7):  LIBIRD  Forward Nepal, Duhab;  Rural Reconstruction Nepal; Save the Earth Nepal, Sahara; RSDC Devangang, JanhitGuthi  SAP-Nepal; Sewak Nepal,Itahari | Community Organizations and Farmers Organizations  Cooperatives  Farmers Groups: Mahila jagriti Krisak Samuha,Babiya; Samuhik Krishi Sahakari, Aurabani |
| Private sector actors | Private Sectors Input suppliers  Tractor Dealers (12 in number)  Rice-Wheat Dealers (8-10)  Pipe Dealers (5-6)  Agro-Vet (Wholesalers, approximately 8-10)  Agro-Vet (Retailers, approximately 200)  Kusuwaha Agrovet, Inaruwa; NSC; BNB Agro Trade Centre | | Credit Agencies (30)  Agriculture Development Bank  Commercial Banks |

**Table 7: Actors and their roles Rajshahi and Rangpur Districts, Bangladesh (CRISP)**

|  |  |  |  |
| --- | --- | --- | --- |
| Sl No | Actors# | Main role | Specific interventions relevant for SRFSI activities related to uptake of agricultural technologies (especially relevant for SRFSI priorities related to CA and WM) |
| 1 | Wheat Research Center, (WRC) Dinajpur | Research on varietal improvement, crop management and crop protection aspects of wheat, Production of breeder seeds, demonstration of improved technologies and training staff of DAE | Main source of expertise on farm mechanization related to conservation agriculture, engineering workshop and farm for training different stakeholders in manufacture and use of CA machinery |
| 2. | Department of Agricultural Extension (DAE) | Implementation of schemes for agricultural development.  Promotion of new technologies through organizing demonstrations, training and field visits  Advise farmers on field problems | Only organization having district wide presence in all unions. Though their capacities (technical and functional) are limited, the programme could work through them in promoting new knowledge among farmers. |
| 3 | RDRS | One of the major NGO in North West Bangladesh. Promote agricultural development through farmer field schools. Has a network of SHGs federated as Union Federations. | Partner in the current SRFSI project and also a partner in some of the previous efforts aimed at promoting conservation agriculture (ACIAR Rice Maize Project) and up-scaling the production of short duration rice and mungbean (funded by KGF) |
| 4 | Research Initiative Bangladesh (RIB), Niphmari | Promotion of new rice varieties, establishment of community seed banks | In charge of one of the CSISA hubs and has been working very closely with CSISA and BRRI since 2009. Tried promotion of PTOS in rice and bed planter in wheat. Experience with promotion of Local Service Providers (LSP) to promote conservation agriculture |
| 5 | CSISA, Dinajpur | Since 2009, promoting conservation agriculture technologies in 5 districts | Experience with promotion of strip till, zero till and bed planting in wheat and maize.  Promotion of Local Service Providers through training and hand holding |
| 6 | Bhola Prasad Shastri Agricultural College, Purnea (under Bihar Agricultural University, Sabour) | Teaching, research and training  Mobile based advisory service;  Attend Kisan Chaupals  Undertaking research on 15 themes/topics (on-going) | Seed Production of paddy and wheat  Evaluation of hybrid maize  Multi-locational trials of wheat  Nutrient trials –wheat and maize  Intensification/diversification of existing cropping system on cultivators field (wheat and maize) |
| 7 | Agricultural Information Service (AIS) Rangpur | Operating under the Ministry of Agriculture, Bangladesh, AIS disseminate agricultural technologies using print and electronic media including the web. Also provide a wider range of information on agriculture in Bangladesh (crops, fisheries, livestock, contact numbers of officials and dealers, weather etc.) | Produce documentary films, posters, folders, leaflets, booklets, newsletters, magazines, banners, festoons and etc. for creating awareness of the farmers on the new technologies |
| 8 | Uttaran Engineering Works | Engaged in manufacture of several agricultural implements (weeders) and machines (tillage equipment and threshers) | Has already manufactures and supply 4- 50 machines through WRC (zero till, bed planter, strip tillage, potato planter etc.). Capacity to manufacture and supply more against firm demand. |
| 9 | Reshoma Engineering Workshop | Engaged in manufacture of agricultural implements (weeders) and machines (tillage equipment and threshers) | Manufactured and supplied zero till, strip planter, bed planter, potato planters etc. based on demand from WRC, CISA and RDA Bogor |
| 10 | Rural Development Academy (RDA) Bogra | Autonomous body officiated with the Rural Development and Co-operatives Division of the Ministry of Local Government, Rural Development & Co-operatives (LGRDC) | Promoted raised bed technology in 4 districts as part of the RDA-Cornell University through lead farmers and tillage service providers  Promoted rice based cropping systems in Barind Regions of Bogra as part of a project funded by KGF |
| 11 | Hajee Mohammad Danesh Science & Technology University  Dinajpur | Has a Faculty of Agriculture offering graduate courses in Agriculture | Source of trained manpower for promoting new technology |
| 12 | Private farm input dealers | At the District, Upzilla and Union levels. | Main source of farm inputs and primary source of “input related” advisory services for most medium and larger farmers. Farmers routinely call their input suppliers to get their recommendations on what inputs to use and how to solve specific technical problems |
| 13 | Market intermediaries | Commission agents and traders involved in sale of farm outputs |  |
| 14 | BADC (Bangladesh Agricultural Development Corporation) | Providing irrigation facilities to the farmer through surface water utilization, import of non-urea fertilizer through G2G arrangement and strengthening of seed production activities with the task of multiplication of high yielding and different stress tolerant varieties of seeds allocating financial support through new projects and programmes. | Production and distribution of quality seeds (contract growing, own seed production farms and processing plants) |
| 15 | Bangladesh Bank | The central bank of Bangladesh ensuring distribution of agriculture loan among the farmers in a hassle-free manner through providing necessary policies to all public and private sector banks. |  |
| 16 | ICM Clubs | 674 Clubs in Dinajpur formed by the DAE | Some of them are engaged in savings and credit and organizing extension programmes and seed production |
| 17 | Barind Multipurpose Development Agency (BMDA), Rajshahi and Dinajpur | Installation of deep tube wells for irrigation and supply of drinking water | BMDA recognizes the importance of promoting water saving crops and reduce dependence on boro rice cultivation |

# Appendix E: CIMMYT interventions in the EGP and Farming Systems Zone Characterization

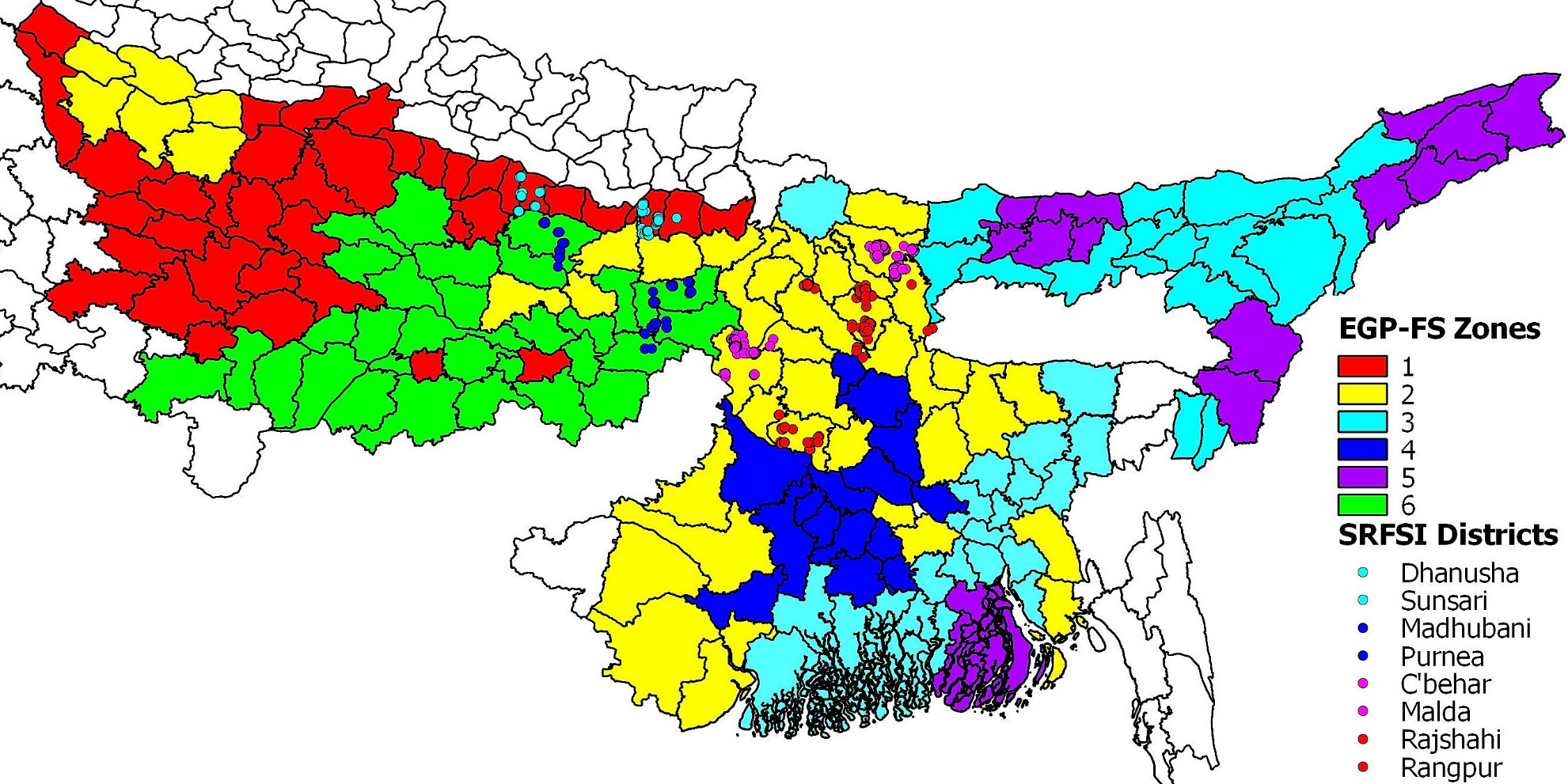


**EGP-Farming Systems Zone Characterization**

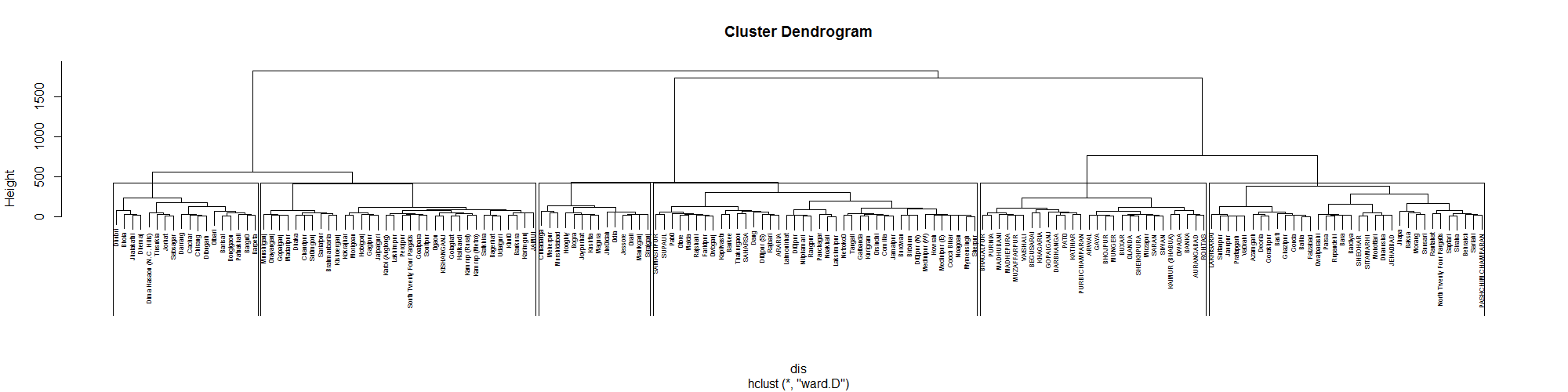
The Eastern Gangetic Plains in South Asia is spread over 180 districts of three countries. Which included Bangladesh, Tarai of Nepal, and Bihar, Eastern UP, West Bengal and Assam of India. It covers approximate 30 M ha land having on an average 173 percent cropping intensity with low crop productivity, exposed to climatic vulnerability such as frequent floods, storm, erratic rainfall, long spell of drought and high pressure of abiotic (salinity, acidity, soil erosion etc) and biotic (weed, pest and diseases) stresses. EGP dominated by rice based farming systems covering maximum area under rice-rice (6.51 M ha) followed by rice-wheat (6.22 M ha), rice-maize (1.0 M ha) and rice lentil (0.7 M ha). Despite having high cropping intensity, the crop productivity is very low. The reasons for low productivity are land fragmentations with domination of small and marginal farm households, low risk bearing capacity, poor market and institutional infrastructure, road connectivity, apart from climate shocks. In addition, very high resource intensive cropping systems having poor mechanization services, high cost of irrigation, seasonal labor scarcity and poor capacity building infrastructure leads to high production cost.

Among the EGP districts, there is a large variability in terms of social structure, farm typologies, farming and cropping systems, land topography, crop yields, infrastructure, markets and policies and governess. Due to these large variabilities, there is no single recipe for technological interventions. For better understanding and targeted technological interventions to make sustainable, resilient, and economically profitable farming systems for enhancing livelihoods of vulnerable small farm households. This synthesis attempts to identify six farming systems zones to address above mentioned issues for better targeted technological and policy interventions. The variable included for farming systems zones are percentage farm household types, cropping intensity, cropping systems, crop yields, irrigated area, mechanization services used, and livestock per household. To characterize farming systems zones, the secondary sources of data were extracted from different reliable published govt. statistics. For identifying the zones, we used cluster analysis in R software (Figure 2). Then we mapped districts falling under each zone in QGIS software (figure 1) and individual zones were further characterized for major features for technological and policy intervention, and potential targeted area for scaling.

**Figure1. Farming systems zones map**



**Figure 2 Cluster analysis for identifying farming systems zones**



**Table 1: Farming systems zones with major characteristics, technological/policy interventions and potential area for scaling**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Farming systems zone | Districts | Major characteristics | Technological/policy interventions | Potential area for scaling |
| 1 (37)  **Key words:**  R-W System; Low Productivity; Poor Irrigation Infrastructure; Social constraints | Jhapa, Morang, Sunsari, Saptari, Siraha, Dhanusha, Mohottari, Sarlahi, Rautahat, Bara, Parsa, Nawalparashi, Rupendehi, Bardiya, Chitwan, Azamgarh, Behraich, Ballia, Basti, Deoria, Fiazabad, Ghazipur, Gonda, Gorakhpur, Jaunpur, Kushinagara, Maharagunj, Mau, Pratapgarh, Sultanpur, St. Kabir Nagar, Vanarashi, Jehanabad, Lakhisarai, Paschim Champaran, Sheohar, Sitamari | * Total 37 districts of Nepal, Eastern UP and Bihar * Total cultivable area 5.83 M ha * Almost double cropping systems having 172 cropping intensity * Dominated by rice-wheat cropping system holding 54 % area followed by 8 % rice-lentil * At least 11 % fallow land and area not used for agriculture. * 84% under irrigated area with limited access due to high irrigation cost and poor coordination and management of surface water irrigation * Poor soil and land management e.g. acidification and soil fertility * More than 60 % farming households availing the mechanized services for farming * Integrated livestock and cropping system are practiced with having 2.40 cattle and buffaloes per household * 73 % small and marginal farm households with fragmented land holdings * Out migration of youth for job opportunities * Poor network of road, input and output markets * Low intake of modern technology and practices * Very poor coordination and linkages among institutions/organizations | * Advance planting of rice and wheat may have significant impact on rice-wheat productivity which can be achieved through use of CASI technologies (ZT planting and supplementary irrigation for early rice transplanting) * Potential scope to improve market linkages and value chain by developing the infrastructure and awareness * Improve mechanization by strengthening local business models * Strengthening integrated farming systems with livestock * Potential scope of intensification to convert summer fallow land to crop land by using ground water provided improve irrigation infrastructure (e.g. electrification, solar energy and surface water) * Great potential for improving lentil productivity by better agronomy and mechanization * Improved agri machineries market * Capacity building and knowledge access of farm communities especially young women farmers * Improve institutional arrangements and capacity building * Improved seed and quality input availability and access | * 2.9 M ha of rice-wheat system’s productivity can be enhanced by advance planting through CASI (ZT) technology, better bet agronomy and improved irrigation scheduling by supplementary irrigation in existing systems. * Approximate 1.0 M ha lentil/pulses productivity can be improved through better bet agronomy and CASI * Approximate 0.5 M ha land can be improved by lime application * Fallow land approximate 0.65 M ha can be converted to crop lands * At least 15 % net sown area (0.8 M ha) can be brought under diversification and intensification with maize and short duration crops where assured irrigation is available * Potential scope of improved mechanization services through local innovation systems/service providers |
| 2 (46)  **Key words:**  R-R system; Unsustainable (water & energy); Erratic Rainfall | Kapilvastu, Dang, Bankee, Balrampur, Sravasti, Sidarthnagar, Comilla, Noakhali, Lakshimpur, Faridpur, Jamalpur, Mymensingh, Narsandhi, Netrokona, Rajbari, Sherpur, Tangail, Natore, Nawanganj, Noagoan, Pabna, Rajshai, Dinajpur, Gaibandha, Kurigram, Lalmonirhat, Nilphamari, Panchagar, Rangpur, Thakurgaon, Alipurdwar, Burdwan, Birbum, Cooch behar, Kolkata, Dinajpur (N), Dinajpur (s), Howrah, Malda, Medinipur (E), Medinipur (w), Araria, Saharsa, Samistipur, Supal, Kishangarh | * Total 46 district falls under Zone 2 having highest cultivable area 8.67 M ha * Maximum number of farm household under small and marginal category i.e. 90%. * Almost two crops in a year having 191 % cropping intensity. * Rice-boro rice cropping system covers 47 % followed by rice-wheat 16 % and new emerging rice-maize occupies 9 %. * 55 % under irrigated area with good access to water markets and well-developed infrastructure for ground water by public sector * Limited fallow lands considering two crops in a year * Total 3.3 M ha under boro cultivation with the 3.60 t ha-1 productivity * Fairly mechanized with 2wheel and 4-wheel tractor * Underdeveloped livestock with low productivity * Around 30-40 % area affected by frequent flash floods * New rice-maize cropping system is emerging * Seasonal agricultural labor crises and high labor prices * Late rice transplanting is general phenomenon because of depending on monsoon rains * Poor local infrastructure for mechanize services * Poor value chain for all the crops * Major problem of biological stresses * Good presence of NGO’s, public and private sector | * Boro rice growing in 3.3 M ha with high irrigation cost heavily depending on ground water pumping and labor intensive can be brought under maize production which has high potential for maize yield with less water and labor. * Improved mechanized services for maize, wheat and boro rice through local business models i.e. Innovation systems/ service providers etc (Seeding, mechanized transplanting, mechanized harvesting and threshing) * Capacity building of local manufacturers and improve regional dealership network for better machinery access. * Capacity building and knowledge access of farm communities especially youth * Improve institutional arrangements and capacity building * Enhance value chain through improved market connectivity and linkages * Rabi maize covers approximate 0.5 ha which can be brought immediately under CASI and mechanized cultivation * Integrated biological stress management practices i.e. weed, diseases and insect pest, provided proper knowledge and information * Potential to use existing network of local NGOs for scaling the CASI technologies * Potential for intercropping with maize that can improve profitability and resilience of small holders * Aman rice transplanting can be advanced through supplementary irrigation which will facilitate for timely planting of winter crops * Better bet agronomy will address soil fertility and long-term sustainability * Further intensification with the introduction of short duration crop/varieties | * At least 1.5 M ha area of boro rice can be replaced with maize to reduce ground water pumping and improve livelihoods of smallholders * 1.0 M ha rice wheat area can be brought under CASI technologies immediately with improved mechanized services * 0.5 M ha existing maize cultivation also brought under CASI (ZT planting and intercropping) * 2.0 M ha boro rice can be brought under improved irrigation scheduling through alternate wetting and drying, mechanized rice transplanting and Direct seeded rice * Aman rice at least 15 % (1.0 M ha) area can be targeted for direct seeded rice * Improved institutional arrangements can be explored for large scale scaling out. * Improved seed and other inputs |
| 3 (35)  **Key words:**  Low laying; Single crop; Low Mechanization; Weak Infrastructure; Flood Prone Areas | Chandpur, Brahmanbaria, Sunamgonj, Hobigonj, Dhaka, Gazipur, Gopalgunj, Kishoerganj, Madaripur, Munshiganj, Naryanganj, Sariatpur, Perojpur, Bagerhat, Khulna, Satkhira, Darrang, Dhurbi, Golapara, Golaghat, Hailkandi, Kamrup (rural), Kamrup (Metro), Karbi (analog), Karimgunj, Kokrajhar, Lakhimpur, Morigoan, Nogaon, Sonitpur, Udalgari, South 24 Parganas, North 24 Parganas, Bankura, Jalpaiguri, Calcutta | * Covering 4.8 M ha cultivable lands in 35 districts * This zone falls under low lying catchment of Brahmaputra and Megna rivers in Bangladesh and Assam. * Aman rice (Monsson) growing only in 58 % due to deep water logging and standing floods followed 42 % area under boro rice. * Monotonous rice-rice system is predominating in the region * Heavily affected by climatic variations * Low irrigated area due to deep floods and excess moisture * Very low mechanization due to poor connectivity and infrastructure * Very little scope for cropping intensification * Uncultivated lands approximate 14 %. * Good coverage of short duration oilseed crops * Majority of farming households are under small and marginal category (80%) * Low crop productivity of crops especially kharif rice, wheat and oilseeds * Both salinity and acidity is major soil problems * Excess moisture is major issue for non-rice crop planting during winter season * Poor market infrastructure * Poor livestock | * Potential to improve fish and rice farming systems * Deep water resistance/tolerant aman rice varieties * Very less scope of crop diversification because of low lying and long-standing water * Improved short duration crops like oilseeds and pulses in low medium to u lands * Improve infrastructure for mechanized services and markets can reduce the drudgery * Livelihood disaster management program should be aligned with agricultural programs * Improve institutional arrangements and capacity building * Soil management for salinity especially in southern Bangladesh | * Improve fish and rice farming systems can be brought under low-lying area * Improved high yielding rice varieties/hybrids can be promoted * Deep water tolerant rice varieties can be introduced * Suitable short duration oilseed and pulses varieties can be cultivated |
| 4 (15)  **Key words:**  Relatively More Productive & Intensive; Resource Intensive; Highly Vulnerable to Biological Stress; Arsenic Prone Area | Manikganj, Chaudanga, Jessore, Jhenaidah, Kushtia, Magura, Meherpur, Narail, Bogra, Joypurhat, Pabna, Sirajang, Hooghly, Murshidabad, Nadia | * Only 15 districts fall under this zone covering 2.29 M ha area * Highest cropping intensity among all EGP farming zones which is 237 percent with short duration vegetable cultivation. * Highest 64 % area dominated by rice-rice system followed by rice-wheat (11%) * Highest boro (3.97 tha-1) rice, wheat (2.9 t ha-1) and rabi maize (5.29 t ha-1) productivity * Well mechanized * Developed markets compared to other zones * Approximately 69 % under irrigated area with good access of ground water * Lowest fallow lands * Fairly developed local commodity based markets * Arsenic contaminated areas * Very poor and underdeveloped livestock systems | * Existing resource intensive farming systems can be transformed to optimize resource utilization through CASI and improved mechanized services * Maize cultivation proved highest productivity in this region, maize area can be further increased by replacing boro rice. * Improve agronomy and soil fertility management for long-term sustainability. * Utilize developed mechanized markets for scaling CASI technologies. * Great potential for integrated livestock and cropping systems to make more resilient farming system * Capacity and knowledge building of farm communities * Improve institutional arrangements and capacity building * Improve dealership network for availability of new machineries | * 1.3 M ha boro rice can be brought under mechanized services (post-harvest and mechanized transplanting) * 0.3 M ha wheat can be utilized for CASI technologies to reduce the cost of production and improve productivity by timely sowing. * 0.2 M ha can be brought under maize cultivation immediately with CASI technologies. * Atleast 0.3 M ha aman rice can be brought under direct seed rice with better agronomy * Improved institutional arrangements can be explored for large scale scaling out. |
| 5 (17)  **Key words:**  Unfavourable Environment; Fallow lands; Very Poor Infrastructure; Nutrition & Food Insecurity | Barguna, Barisal, Bhola, Jhalakhati, Patuakhali, Barpeta, Baksa, Bongigaon, Cachar, Chirang, Dhemaj, Dilbugarh, Dima Hassaon (N. C. Hills), Jorhat, Nalbari, Sabsagar, Tinsukia | * Total cultivable area 2.23 M ha, covers 17 districts of Assam and Bangladesh * This zone covers coastal areas of Bangladesh and foot hills of Assam * Low cropping intensity 143 % which covers 14 % fallow lands. * Very low crop yields * Rice-rice system covers marginal only 12 %. * Only kharif rice followed low input pulses and oilseeds crops * Low mechanization * Poor markets * Highly vulnerable to climate * Mainly rainfed farming systems, only 10 % area under irrigation. * Good balance of small and medium farm households * Limited access of underground water due poor quality and costly infrastructure | * Potential scope to convert fallow land to crop land by introducing pulses and oilseed with mechanization * Improve yields of rabi crops i.e. pulses, oilseed, wheat and maize through better bet agronomy and mechanization. * Improved mechanization services to address the excess moisture at the time of planting * Efficient use of surface water for irrigation * Potential scope to improve livestock productivity * Improve marker infrastructure for better access * Use deep water resistance aman rice varieties in southern Bangladesh | * Potential scope to convert 0.31 M ha to crop land with mechanization and introduction of pulses and oilseeds. * Rice-fallow of 0.7 M ha can be brought under rabi crops with mechanized services. * Maize and wheat can be explored with surface water irrigation |
| 6 (30)  **Key words:**  R-W, R-M System;  Flash Flood & Drought Vulnerable; Low productivity; Land fragmentation; Social Constraints; Poor Land Management | Mirzapur, Chandauli, Arwal, Arungabad, Banka, Begusarai, Bhagalpur, Bhojpur, Buxar, Darbanga, Gaya, Gopalgunj, Kaimur (Bhabua), Katihar, Khagara, Madhepura, Madhubani, Munger, Muzaffarpur, Nalanda, Nawada, Patna, Purbi Champaran, Purnia, Rohtas, Saran, Sheikhpur, Siwan, Vaishali, Jumai | * 30 districts, covering 5.5 M ha land of Bihar and Eastern UP * Lowest cropping intensity among the farming zones, covers approximate 18 % fallow lands. * Both kharif rice and maize growing area. * Major cropping system is rice-wheat, covers 41 %. * Very low wheat productivity due to late planting of wheat * Emerging rice-maize systems in some districts with high yield potential * 56% irrigated land but uncertain access and high cost of irrigation of ground water. * Complex social structure with fragmented land * Farming systems decision control by land owners rather tenant farmers * Poor market network and infrastructure * Risk of flash floods and droughts * Poor land management especially soil acidity * Well mechanized for tillage which is very resource intensive but very low mechanization for planting and other agricultural operations * Very poor coordination among the institutions and schemes | * Improve wheat yield by advance planting through CASI mechanized services * Improve mechanized services for maize planting and value chain for grain drying and storage * Zone having highest fallow land approximate 1.0 M ha due to low ground water infrastructure and access which can be converted in crop lands by improving ground water access for irrigation. * Land crop suitability can be improved through lime application in acidic soils. * Land tenure systems can be improved which will help to improve land and water productivity. * Improve mechanized services for CASI or in general can enhance crop productivity, intensity * Improve seed systems for high yielding varieties for all crops * Improve market network especially for output and input * Improve institutional arrangement for better coordination and effective implementation * Better soil fertility management and nutrient management is key for improving the productivity * Green energy infrastructure to improve irrigation access and to reduce high irrigation pricing * Develop better drainage system to reduce flood risk in the region | * 1.9 M ha rice-wheat system can be improved by advance planting through CASI technologies. * 1.0 M ha fallow land can be brought under cultivation through improved irrigation systems and CASI technologies. * 0.3 M ha maize are can be brought under better agronomy and CASI technologies to improve maize productivity and rice-maize system sustainability * 1.1 M ha land can be improved by lime application which will improve land productivity * Yield of oilseed and pulses covering approximate 0.9 M ha area can be enhanced by better agronomy and CASI * Better market linkages can help farmers to get fair price of their farm produce * Integrated livestock and cropping systems can improve livelihoods and resilience |

\*different color represents districts of each country/state: Nepal; Bangladesh; Eastern UP; Bihar; West Bengal and Assam

# In parenthesis represents number of districts in each zone

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# Appendix F: Impact estimates from SRFSI

(adapted from Brown, 2017)

The estimates of the potential impact of SRFSI result from an analysis of the probable technologies that will be developed and adapted by the project, the effects that these technologies are likely to have on farmer yields and costs of production, and how many exposed farmers will possibly adopt these technologies. Obviously, as there are many technologies and different ways that farmers can be exposed to these technologies, as well as many unmeasurable factors such as, for example, the quality of the exposure and information that the farmer receives, there are considerable grounds for error in the estimates – and estimates may be too low or too high. There are also many assumptions that have had to be made to reach these estimates of impact. The assumptions are listed below followed by tables of adoption and impact in two time frames – five years and ten years – as well as with and without the scaling out project.

SRFSI project dimensions;

* Districts: 8
* Communities per district: 5 or more
* Collaborating farmers per community: 10 or more
* Field days per community under SRFSI: 0.75 per season in the 2017 summer and 2018/19 season.
* Field days per community with scaling out project: at least 1 per season (until 2020/21)
* Farmers per field day: 100 “new” (un-exposed) farmers.

**Spontaneous adoption rate**

The rate of spontaneous adoption (farmers who adopt a technology without receiving formal information from a project or research and/or extension personnel) is probably the most important determinant of impact numbers, especially in the longer term. Adoption tends to be exponential- slow at first and increasing in rate with time. The annual growth rate of farmers adopting zero-tillage in the NW -IGP was (on average over the 10-year period 1996-2006) over 3 – each year there was a 300% increase in the number of farmers practicing zero tillage. We have used conservative estimates of rate of spontaneous adoption, and this rate is assumed to be considerably higher if and when the scaling out Project is in place because of all of the additional activities (exchange visits and subsequent support to research and development in these communities, messages in multiple media, further capacity building for service providers and agro-dealers etc.).

Rate of growth of spontaneous adoption: 2.7 and declining by 0.1 each year

For simplicity we have assumed that adoption of all technologies is among the same group of farmers – the group that adopts the most widely adopted technology (in this case “Timely seeding of the rabi season crop”). Some of the farmers who adopt timely rabi season seeding will adopt one other technology, some three technologies, some four technologies etc. If this does not happen – if the farmers who adopt timely rabi season seeding are completely different to those adopting, say, supplementary irrigation, then the impact estimates will be affected. However, in the latter case there will be more farmers adopting technologies than we estimate (because the groups adopting different technologies are distinct), but the average benefits to farmers adopting technologies will be lower – because they have adopted fewer technologies each. The total benefits over the EGP will not be affected by this assumption.

**Technologies and adoption rates.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Technology | % of project community farmers who adopt | % of “Field day farmers” who adopt. | % of Exchange visit farmers who adopt [[25]](#footnote-26) | Average yield benefit (kg/ha) [[26]](#footnote-27) | Average cost savings ($/ha) |
| Rabi season irrigation – India and Nepal | 30 | 5 | 15 | 500 |  |
| Rabi season irrigation – Bangladesh | 5 | 2 | 5 | 500 |  |
| Nutrient management – rice | 20 | 10 | 15 |  | 80 |
| Nutrient management – rabi crops | 10 | 5 | 5 |  | 150 |
| Increased rabi cropping intensity | 40 | 25 | 30 | 3000 |  |
| Timely establishment of rabi crops | 60 | 32 | 45 | 500 |  |
| CA - rice | 15 | 5 | 10 |  | 80 |
| CA – rabi crops | 60 | 10 | 30 | 200 | 80 |
| Improved crop management in general | 80 | 15 | 30 | 200 |  |

**Economic assumptions:**

Value of wheat grain: $300/t

**Farm size effect.** We express benefits on a “per hectare” basis, and therefore the benefits that a particular farming household achieves will be proportional to the farm size – or the area on which they apply the particular technology. In calculating total benefits to the project we have assumed that the **average farm size is 0.5 ha**, which is probably too large. Estimates of total benefits can be reduced proportional to average farm size, or to the proportion of the farm on which farmers adopt new technologies.

Based on the sum of all the above assumptions, we reach the following adoption figures:

Four Years from start of project (mid-2018)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Technology | Total primary adopters | Total adopters | Benefits AUD/ha | Increased grain production (t) | Total annual project benefits (AUD) |
| Rabi season irrigation - India and Nepal | 1,747 | 4,409 | 150 | 1,102 | 330,673 |
| Rabi season irrigation - Bangladesh | 169 | 452 | 150 | 113 | 33,937 |
| Nutrient management - rice | 3,230 | 8,690 | 80 | 0 | 347,602 |
| Nutrient management - rabi crops | 1,578 | 4,293 | 150 | 0 | 321,965 |
| Increased rabi cropping intensity | 8,103 | 21,389 | 900 | 32,084 | 9,625,150 |
| Timely establishment rabi crops | 11,028 | 28,483 | 150 | 7,121 | 2,136,232 |
| CA - rice | 1,853 | 4,781 | 80 | 0 | 191,243 |
| CA - rabi | 5,376 | 12,585 | 140 | 1,259 | 880,976 |
| Generally improved crop management | 1,220 | 12,513 | 60 | 1,251 | 375,382 |
| Totals |  |  | 1,710 | 42,930 | 14,243,159 |
|  |  |  |  |  |  |
| Average benefits AUD/ha |  |  | 993 |  |  |

Ten Years after start of project (mid-2024)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
| Technology | Total primary adopters | Total adopters | Benefits AUD/ha | Increased grain production (t) | Total annual project benefits (AUD) |
| Rabi season irrigation - India and Nepal | 1,513 | 537,714 | 150 | 134,429 | 40,328,560 |
| Rabi season irrigation - Bangladesh | 227 | 54,586 | 150 | 13,647 | 4,093,986 |
| Nutrient management - rice | 2,707 | 1,051,163 | 80 | 0 | 42,046,508 |
| Nutrient management - rabi crops | 1,343 | 517,893 | 150 | 0 | 38,841,989 |
| Increased rabi cropping intensity | 6,594 | 2,608,823 | 900 | 3,913,235 | 1,173,970,495 |
| Timely establishment rabi crops | 8,593 | 3,503,690 | 150 | 875,923 | 262,776,783 |
| CA - rice | 1,435 | 581,345 | 80 | 0 | 23,253,787 |
| CA - rabi | 3,338 | 1,584,985 | 140 | 158,499 | 110,948,951 |
| Generally improved crop management | 1,220 | 1,701,826 | 60 | 170,183 | 51,054,768 |
| Total benefits/ha - adopting all technologies |  |  | 1,710 | 5,265,914 | 1,747,315,827 |
|  |  |  |  |  |  |
| Average benefits AUD/ha |  |  | 987 |  |  |

# Appendix G: Priority Nodes SRFSI

**List of nodes under SRFSI with different performance category (A Priority, B Focus, C Handover) and future relevance (to Policy or Scaling or both)- status April 2017**





# Appendix H: Summary of SRFSI Variation 3 proposal

Sustainable and resilient farming systems intensification in the eastern Gangetic Plains (‘SRFSI’)

A component of DFAT Sustainable Development Investment Portfolio (SDIP 1)

**CSE/2011/077**

Variation 3 – to extend the project duration from June 2018 to June 2019

By

Lennart Woltering, Dr. Thakur P. Tiwari and Dr. Mahesh K Gathala

International Maize and Wheat Improvement Center (CIMMYT)

For ACIAR: Drs. John Dixon (CSE), and Eric Huttner (CIM)

1. **Background**

Since 2014, the SDIP 1 / SRFSI initiative has implemented a science-led and participatory effort to innovate, target, and scale Conservation Agriculture based Sustainable Intensification[[27]](#footnote-28) (‘CASI’) technologies in the Eastern Gangetic Plains (EGP), a global ‘hotspot’ for rural poverty, and also an area of extreme vulnerability to contemporary and projected climate extremes. These efforts seek to improve water, energy and labour productivity and resilience (thereby contributing to Food-Energy-Water “FEW” security), while also boosting agricultural profitability, improving livelihoods and reducing poverty – thereby contributing to SDIP outcomes*.* Priorities include reduced tillage using machinery, crop diversification and rotation, (energy-) efficient water management practices, and integrated weed management practices. Establishing crops with minimal soil disturbance ­- reduced tillage, as opposed to conventional tillage CT - can be done using zero-tillage (ZT: seeds and fertilizer placed in a narrow slot made by a knife on a no-till seeder) or strip-tillage (ST: a narrow band of soil is cultivated). Whenever possible and appropriate, residues from the previous crop are left in the field while the crop is established. Complementary innovations such as improved varieties, soil fertility management, improved irrigation, market access, and farmer-learning through innovation platforms have been included in CASI, which are a cluster of sustainable farming system practices. Good knowledge of CASI and access to key services would enable farmers to adopt it. An estimated 52,000 households have already benefited from CASI through the SRFSI project. The target of SFRSI scaling Variation 3 is to contribute to 1.5 million farm households increasing their income by adopting at least one CASI technology by 2021. To date, the project focused mainly on testing, validating and demonstrating technologies, conducting socioeconomic research, and identifying policy constraints. Results obtained by thousands of farmers in 40 areas over 8 districts in 3 countries, documented in SRFSI reports and publications, demonstrate that in most contexts and systems, adoption of CASI technologies can save water, energy, labour and time, while often increasing yield to some extent. Input savings reduce production costs while time and labour savings enable new cropping systems. Both have the potential to increase farmers’ income. Research and initial dissemination of CASI has involved multi-stakeholder Innovation Platforms (IP), established in 8 different districts across the 3 countries, fostering a transboundary regional learning exchange. Insights derived from the IPs have been instrumental in identifying enabling factors required for the sustained adoption at scale of CASI technologies. Key bottlenecks to change include poorly functioning value chains (notably for machinery that can be applied to CASI), as well as persistent knowledge gaps among farmers, service providers and policy makers at local, national and regional levels about the promise and appropriate use of different technologies. The potential of CASI to improve farmers’ income has been recognized by decision makers in some jurisdictions, as exemplified by the West Bengal and Indian government’s decision to invest 1 million US Dollars over 3 years to support the dissemination of CASI in West Bengal. This SRFSI variation 3 extends the project to June 2019 with the aim to promote scaling-out of CASI, towards the 2021 target. Based on the recognized needs, the commitment and resources of government and non-government scaling partners, and the expertise and resources available to the project team, the project will support scaling with emphasis on **capacity development of agents of change at various levels of the local agricultural sectors**.

1. **Strategy**

The strategy for variation 3 is guided by state of the art approaches on scaling, notably;

* The concept of the **scaling ingredients**. This follows the principle that in order to scale any technology, one needs to scale at least 9 other “ingredients” as well (Figure 1). CIMMYT and PPPlab[[28]](#footnote-29) , in conjunction with a to-be-defined local partner, will use this tool to do a rapid assessment of the scalability of CASI technologies in different environments to integrate scaling in Theories of Change (Theories of Scale) and impact pathways, and it allows to map and systematically prioritize interventions. This will be used as a vehicle to build capacity on, and learn from, the multiple scaling processes initiated in the project. The tool should be used by project partners.



*Figure 1: Important ingredients for scaling*

* **Responsible scaling** (Wigboldus and Leeuwis, 2013) where one critically looks at what scaling processes could lead to and assess their appropriateness, relevance and sustainability in the short and long term. It focusses on potential desired and undesired effects on, for example, the environment, gender and other socio-economic factors. This builds on the multi-criteria technology assessments prioritized through the Innovation Platforms. There are synergies with the work planned under SDIP 2 on the FEW Nexus to determine the desired space for scaling- looking at the trade-offs between various goals, e.g. agricultural productivity and irrigation vs domestic water use.
* Instead of directly MAKING things go to scale, the SRFSI project will rather CATALYSE, **HELP and MONITOR practices going to scale**. This requires a shift from high control (e.g. direct field activities), to high connectivity (e.g. development of market intelligence, relevant access to finance, and support for CASI mainstreaming by public, NGO and business groups), for sustainable and widespread adoption of CASI technologies. This will build on the strong partnerships developed in the first stage of the project. As responsibilities for scaling are passed on in this way to local partners, there will be a need to develop their competencies to manage and implement scaling processes and to build local strategic partnerships. The SFRSI project team sees its role to help create an enabling environment for change by raising capacity of partners to execute successful agriculture scaling and development support programs.
* Focus investments on **capacity enhancement for scaling** to improve the enabling environment for large-scale uptake of CASI innovations. This builds on the trainings offered through the current project, and includes capacity development on other topics identified using the scaling ingredients concept. For example, instead of providing financing, we build capacity on financial literacy and linkages of farmers and service providers, and support financial institutions to develop financial products suitable to CASI farmers and service providers. We also target decision makers by publishing the synthesis of the results obtained during the research phase of the project. Targeting the right people and organizations is key, and their needs are identified in a capacity needs assessment that started in August 2017 under the current project. From the initial results of the capacity needs assessment and rapid assessment of scaling opportunities, the capacities of the following groups could be targeted:
  + Partners (NGO, University, Extension)- focus capacity development on organizational development, scaling strategies, process documentation, training capacity and quality, etc. to equip the partners to scale CASI beyond the project lifetime.
  + Existing and new service providers- value chain and business model development, improved service delivery to farmers (finance, training, inputs), promote linking up with new/different partners (chamber of commerce, banks, etc.).
  + Decision makers- awareness of constraints and solutions around CASI, program design, theories of change and scaling, PPP, institutionalization, etc.
  + Farmers and farmer groups - reached through partners with training on CASI practices, access to markets and services, organizational development, etc.

The variation 3 builds on the investments and lessons learned from 3 years of implementation of SRFSI. This is reflected in the strategy as follows:

* Continue to support successful approaches to scale CASI innovations, for example:
  + **Innovation Platform (IP)**: IPs have provided farmers a platform to interact with other multi-stakeholders forum or individuals to whom they were “invisible” before. Key lessons on IPs were distilled in a recent synthesis workshop of SRFSI experience. Diversity of members (men/women/youth, private/public sector) is good indicating that incentives along the value chain are well aligned. Most IPs provide rental services for machines and demand is higher than they can service. Successful IPs are built upon existing structures (e.g. farmer clubs/self-help groups). Challenges exist around access to machinery, stakeholder capacities and sustainability. Currently a guidebook and policy briefs are prepared under leadership of CSIRO. Documentation around drivers for adoption and self-sustaining IPs needs to be sharpened. Understanding well the local enabling environments for the successful, and less successful, IPs is critical for scaling. A review of IPs is currently being undertaken by an independent consultant. The report (due October 2017) will help answer the question: In supporting farmers to adapt and adopt new technologies and management and marketing strategies what local processes of innovation and support are proving to be most successful and cost effective and how could these function at a larger scale? Where CSIRO and project partners played a leadership and, later, facilitation role in setting up IPs, their role will now be to provide backstopping and process documentation.
  + **DeHaat model** (from NGO Agrevolution) of facilitation and connecting buyers and sellers, through support of partner BAU and UBKV. Support replication and local adaption of the model to other districts.
  + **National and state programs** in all 3 countries are being designed, or are already in place, to promote CASI technologies. Influenced by the SRFSI project research outputs, policy briefs and field visits, the partners in West Bengal have already submitted their own proposal to support their state government with the implementation of the program. Similar opportunities exist for convergence of SFRSI objectives with those of large national/state programs. For example CIMMYT is already influencing the implementation of the Prime Minister Agricultural Mechanization Program (PM AMP) in Nepal and SRFSI could provide advice on pathways to scale (how to do landscaping, how to translate visions into programming, how to build in learning agendas), process indicators, gender integration, collaboration with the private sector, etc.
* After July 2018, direct interventions of the project will focus on 6 districts (Rajshahi and Rangpur/Dinajpur in Bangladesh, Coochbehar and Malda in West-Bengal, Purnea in Bihar, India and Sunsari in Nepal) and 15 priority nodes (from the 8 districts and 40 nodes where research has been conducted so far). This means that investments in learning, capacity building and project financial support (see 4. Tools and resources) will be concentrated. However, since a range of stakeholders will be trained who are not confined to only those areas (national extension agents, NGOs, banks, etc), scaling is expected to happen far beyond the target area, through convergence with existing programs and projects.
* Farmer decisions on adoption of CASI practices depend on knowledge and skills acquired through SRFSI IP field days, farmer training and wider communications, as well as availability of inputs and machinery from service providers. While successfully reaching and benefiting more than 50,000 households, SRFSI has acquired an understanding of some of the major requirements for CASI adoption. New diversification crops such as maize, or maize intercropped with vegetables, are more likely to be entirely grown with a full CASI package. For traditional crops such as wheat and lentils, farmers often trial selected CASI practices first.
* SRFSI has gained considerable experience with the engagement with local entrepreneurs which is being evaluated by an ongoing consultancy which will fine tune the methods for working with local businesses.
* The success of the SRFSI gender participation and monitoring strategy is well appreciated. In a recent synthesis, an advisory platform for deepening gender engagement in ACIAR SDIP has been established.
* A recent policy dialogue on scaling CASI in South Asia decided to establish a regional knowledge sharing consortium or platform, which will be valuable for wider long term sharing of CASI knowledge and coordination of supporting policy dialogues.
* Given the short time left in the project it is proposed to focus resources (financial and human/consulting) on learning around priority scaling ingredients in each region. Those priorities should become clear from doing a scaling assessment, but the following Table gives an indication of preliminary results from this analysis.

Table 1: Summary of challenges and opportunities per region and proposed prioritization of scaling focus

|  |  |  |  |
| --- | --- | --- | --- |
| **Region (partners)** | **Challenges** | **Opportunities** | **Priority Variation 3** |
| Bangladesh (RDRS, BARI,  DAE, Conservation Agriculture Service Providers Association CASPA) | * Poor access to affordable and quality machines for ZT/ST tillage, threshing and post-harvest * Rajshahi- poor demand for machines | * Synergies with CIMMYT/iDE CSISA MI project on machinery value chain * Good quality data available to build credible case for CASI * RDRS and its network can reach +/- 4 million people * About 110 Versatile Multicrop Planters (VMP) operated by Local Service Providers (LSP) in 2017, united in CASPA * BMDA and its network can facilitate for crop diversification and mechanization through guided control on deep tube well irrigation network | * Learn around scaling in NGO-led context * Machinery Value Chains * Knowledge exchange with CSISA * Building awareness and knowledge of CASI in RDRS extension staff and RDRS partners staff * Training the VMP Local Service Providers in business skills * Expand farmers demand for services around LSP by awareness and capacity building programs |
| India- Bihar  (BAU, AgRevolution, Jeevika, ICAR, Sakhi) | * Capacities around PPP * Scaling beyond SRFSI project * Soil fertility and crop nutrient management in high potential maize areas. | * Good experience working with NABARD and with partners intervening at market level/micro-entrepreneurs (DeHaat), community mobilization (Jeevika) * Machines are available | * Learn around scaling in private sector-led context * Data and ICT (e.g. for market aggregation and price knowledge) * Access to finance * Business models around links with big private sector players |
| India- West Bengal  (UBKV, DoA WB) | * Capacities to strengthen value chains | * Experience with a backstopping role to support scaling. * Submitted a proposal to the state government to support scaling of CASI * Good institutionalization of aligning research and extension (steering committee, clear roles and responsibilities). * Dynamic business environment * Machines are available | * Learn around scaling in Public sector-led context * Integration of scaling thinking into state programming * M&E around UBKV/DoA showing leadership in scaling in the state |
| Nepal  (NARC, DoA) | * Weak partnerships within and beyond districts * Poor access to machines * Weak capacities beyond research. | * Large demand from farmers for zero-tillage, but poor support * Prime Minister Agricultural Mechanization Program (PM AMP) * Good experience working with self-help groups to explore the potential for mechanization | * Public sector governance (to influence PM AMP), * the effect on the scalability of CASI through better partnerships |

The targeting and focus of scaling efforts will also be framed by the six distinct mapped and characterized farming system zones in the EGP (output of a SRA commissioned to inform this Variation 3, Appendix E section 10). Each farming system zone has different resource, institutional and food energy water constraints and opportunities for CASI, and therefore different scaling and impact pathways.

* Emphasis on **monitoring, evaluation and learning** from different scaling models and processes that the project will be catalyzing and backstopping and integrating that with good feedback mechanisms to partners, farmers and other stakeholders. This will help build a credible case for scaling CASI and learning within/across regions. CIMMYT will hire an additional M&E&L under variation 3 to support this. A Communication Specialist has been engaged.
* A study to assess to adoption of CASI innovations among farmers and other actors along the value chain will be performed at the end of 2018. The adoption process will be captured according to who is reached (trained, aware), who tested and adopted the CASI innovations, and the motivations behind it. This is summarized in Figure 2. The study goes beyond the individual scale to capture factors that affect the enabling environment for adoption. Focus group discussions with farmers and value chain actors (e.g. innovation platforms or individual) will be performed. Decision makers and partners will also be asked on their willingness to promote CASI outside the project context.



*Figure 2: Adoption process, project activities and focus of the adoption study*

* Moreover, typical **indicators** for the progress on scaling will focus on whether CASI is known, available and bringing benefits to farmers. Measurements involve the level of capacity building, mainstreaming in programs and investment by the private sector in CASI[[29]](#footnote-30).
* Set up of a **repository of training materials** (trainer and trainee manuals, posters, videos, etc.) relevant to CASI technology, credit facility/financing, business models, value chains, etc. Training materials currently used in the SRFSI project will be collected and made available to all stakeholders (private, public, etc.) from one single source. It will be complemented with materials developed under CSISA, SIMLESA and other CIMMYT, ACIAR funded programs, for example, but also the scaling and other tools.
* Scale capacity enhancement efforts for **Rabi season** 2017/18 through **ToT** of 3-level cascade system (Cap Needs Assessment, M&E&L). The potential for innovation, and higher profitability, is highest in the Rabi season (Oct-Mar) as farmers are willing to deviate from known crops and practices. In contrast, farmers tend to stick to rice in the Kharif season. A training campaign will be implemented the coming months, to boost adoption of CASI among farmers and other stakeholders. This training campaign needs to be prepared based on the existing SRFSI and other resource materials. The capacity building activities will be closely monitored The training will occur at three levels in a training-of-trainer cascade:
  + Level 1: This is primarily a planning meeting engaging the L1 trainers who will: Plan the ‘train the trainer workshops, Agree on the key technical and management issues to be presented and develop and agree on the ‘session plan’ for the training (already incorporated in SRFSI work plans from early September SRFSI partners’ review and planning meeting)
  + Level 2: Level 1 trainers deliver to Level 2 trainers the ‘train the trainer’ program (already work planned in each district) that aims to provide the Level 2 trainers the necessary skills and information to conduct Level 3 training to the farming groups at the node level.
  + Level 3: Node/community level- training of farmers and communities, late October/November (already planned).

1. **Role of partners**

With the onset of the Variation 3 and an accelerated effort to build capacity to scale CASI innovations, SRFSI empowers partners to lead the scaling efforts. In a way, activities may be out of the “sphere of control” of the project team, and shift to a “sphere of influence” where we build capacities of partners to enable farmers and service providers make a conscious decision to adopt certain CASI innovations. This is an important and crucial step in any scaling process, after all, we want CASI innovations to be adopted far beyond the project lifetime. Table 2 below gives an overview of the partners and their key roles under variation 3.

Table 2: SRFSI partners and their roles

|  |  |  |
| --- | --- | --- |
|  | **Partner** | **Key role:** |
|  | CIMMYT | * Project leadership and management (reporting, etc) * Contract partner to ACIAR * Leadership in learning on scaling methods; hiring and coordination of required expertise to evaluate scaling methods * Individual and organizational capacity building of partners * Set up and manage repository of learning materials on CASI |
| Australian | CSIRO | * Plan, backstop and process documentation around potential for scaling of Innovation Platforms * Monitoring, evaluation and learning (M&E&L) innovation platforms * M&E&L 2017-18 rabi season * Conduct paper write-shop, data management and analysis including socio-economic data together with CIMMYT and Curtin University |
| Curtin University | * Continue gender component (e.g. gender productivity changes due to CASI, focus more on impacts than outcomes) * Support the integration of gender in the various national/state programs SRFSI will support * Contribute to the analysis of outcomes of the first year of variation 3 and draw lessons about scaling strategies * Develop a manual/ guideline for farm business economic analysis for smallholder farms together with CIMMYT SEP * Conduct training on SE data management training together with CSIRO and CIMMYT. |
| Queensland University | * No additional funding from Variation 3: research activities ramping down by June 2018 |
| International | IFPRI | * No additional direct funding from Variation 3. However, their expertise would be utilized for adoption study. |
| iDE | * CIMMYT and iDE have been partners for the implementation of CSISA MI in Bangladesh. iDE has relevant experience and capacity building skills in development of machinery value chains. Re-start collaboration on machinery value chains in Bangladesh. * Market studies around machinery and other priority value chains * Actively align incentives along those value chains * Provide recommendations on seed money to catalyse particular activities (buy machines/spare parts) * Capacity needs assessment and trainings * Identify obstacles to scaling of the value chain (from tax issues, to capacity, to access to finance, to awareness, etc.) |
| **National partners** | | |
| Bangladesh | BARC | * No additional funding from Variation 3 |
| BARI | * Engaged in ToT and farmer outreach program primarily in Rajshahi * Support agricultural machinery value chains * Knowledge exchange with CSISA and other projects * Institutional capacity building around scaling |
| DAE | * Support the integration of CASI in national scaling programs * Capacity building of farmers * Backstop learning around IPs and other multi-stakeholders forums |
| RDRS | * Lead partner for capacity building on scaling in Bangladesh. * Lead M&E&Learning around NGO-led scaling * Activate network to increase awareness on CASI * Training on CASI of agricultural staff not yet involved with SRFSI to integrate principles of CASI in other and future programs * Identification of actors along the machinery value chain and bring them together for capacity building, for example VMP local service providers * Knowledge exchange with CSISA and other projects * Backstop learning around IPs and other multi-stakeholders forums |
| Others | * Expand the Versatile Multicrop Planter (VMP) market in the most appropriate areas, building on existing network of Local Service Providers and their professional body CASPA |
| Nepal | NARC | * Lead partner for capacity building on scaling in Nepal * Support the integration of CASI in national scaling programs, notably the PM AMP * Support improvement of machinery value chains * M&E&L around adoption and scaling * Outreach programs |
| DoA Nepal | * Support the integration of CASI in the PM AMP * Backstop learning around IPs and other multi-stakeholders forums |
| Agrevolution | * Expand CASI technologies and practices using DeHaat model in Bihar and explore scaling DeHaat model in Nepal |
| Bihar | ICAR | * ToTs Rabi season 2017-18 (Level 1 training) * Production success stories including policy briefs * No additional funding from Variation 3. |
| BAU | * Lead partner for capacity building on scaling in Bihar * Support the integration of CASI in state scaling programs * Support scaling of promising service provider models such as DeHaat and Arayank * Organisation of platforms on access to finance and use of ICT for scaling CASI technologies * M&E&L around scaling, use of ICT and access to finance * Potentially take over responsibility for maintenance and dissemination of training materials in the repository * Backstop learning around IPs and other multi-stakeholders forums |
| Sakhi | * No additional funding from Variation 3 |
| JEEVIKA | * Community mobilization for awareness and demand creation for CASI technologies * Mobilise its own funding from World Bank |
| AgRevolution | * Developing business skills of aspiring micro-entrepreneurs and scaling the DeHaat model over this 2017-18 rabi season. * Leadership in business skills development (similar to the role of iDE in Bangladesh) * Encourage private sectors to invest on CASI innovations |
| West-Bengal | UBKV | * Leadership integration of scaling thinking into programming, notably the proposal on scaling CASI put forward to the West Bengal Department of Agriculture * M&E&L around UBKV/DoA showing leadership in scaling in the state (public extension-led scaling model) * Support improvement of the machinery value chain * Lead on capacity building efforts in the region * Collaborate with Agrevolution to improve business skills in West Bengal |
| DoA - WB | * Support the integration of CASI in state scaling programs * Capacity building * Strengthen multi-stake holders forum for CASI innovations |

1. **Resources and instruments**

An additional 2.4 M AUD is made available by ACIAR to support the implementation of variation 3. The Variation budget file has an additional summary sheet showing only the budget allocations for the additional 2.4 M AUD.

Important additional instruments for implementation are the following:

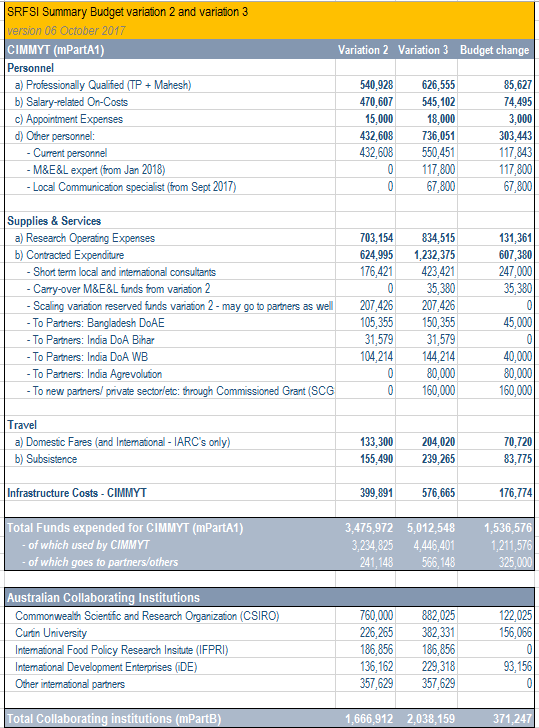
* CIMMYT:
  + 1 M&E&L and 1 communication long term expert
  + Strengthened collaboration with CIMMYT CSISA program, and CIMMYT HQ by involvement of contracted CIMMYT experts (machinery, programming, socio-economics, adoption, gender and scaling) for the SRFSI project scaling activities.
  + 222,500 AUD for bringing in specialists from sectors that were prioritized as a result of the application of the scaling tool (finance, partnerships, communication, lobby, etc): details are in Table 7 of the proposal.
  + Fund earmarked for scaling activities (still about 100,000 AUD left of what was budgeted in 2016 (payment 6) initiated by CIMMYT such as funds for meetings and testing of equipment, and other expenses that require a quick response.
* Partners:
  + Concentration of funds to existing “local scaling partners” who take the lead in scaling out (see 3. Roles of partners, and Table 2 above).
* New collaborations/ piloting:
  + Strategic Commissioned Grant Scheme (160,000 AUD) to fund eligible organizations and businesses who propose suitable plans to support an enabling environment for scaling of CASI technologies.
* Co-financing
  + All partners provide co-financing for activities as stipulated by the rules and regulations of ACIAR.

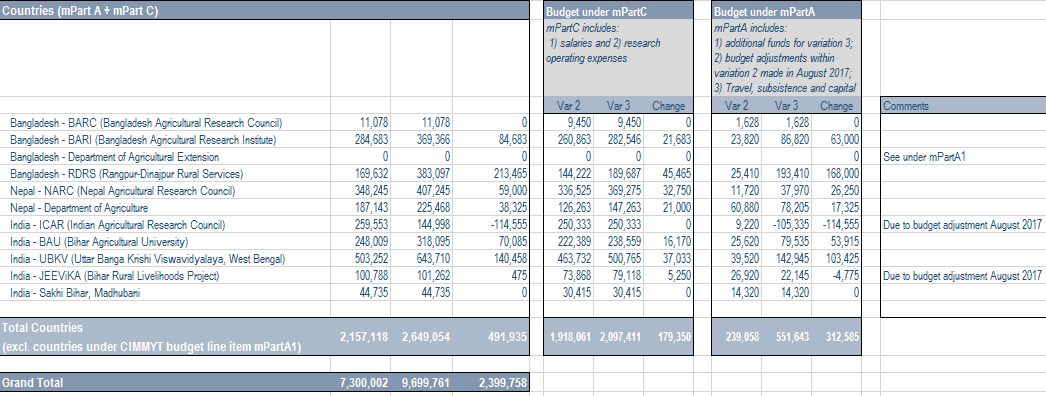
1. **Planning**

The activities under the existing SFRSI variation 2 will be implemented as planned until June 2018. Long-term trials will terminate after the 2017/18 winter season, and activities in Madhubani (Bihar) and Dhanusha (Nepal), and non-priority nodes will be handed to national partners. The implementation of the strategy of variation 3 will start as soon as this proposal is accepted. Below the main planning of activities is given:

1. Until June 2018: Continuation of planned research, **analysis and synthesis** activities of SRFSI variation 2.
2. Sep-Oct 17: Capacity Needs assessment and set-up repository of training materials
3. Oct-Nov 17: Rabi season trainings
4. Oct 17-Mar 2018: Rabi season M&E&L on scaling
5. Jan 2018: Scaling assessments and Capacity Development strategy (assessment and interviews)
6. Feb 2018: ACIAR project review
7. July ’18-Jun 2019: implementation of capacity for scaling strategy with emphasis on rabi 2018/19
8. Dec 2018: Adoption study
9. April 2019: SRFSI final workshop
10. 30 June 2019: end of project

# Appendix I: Budget Worksheet





# Appendix J: Variation 4 Budget worksheet

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **SRFSI final year Budget** | | | **718,474** | **Ex. Rate (USD-AUD)** | | **1.40** |
| **CIMMYT Funds** | | | | **590,671** |  |  |
| **Personnel** | | | | | | **222,390** |
|  | **a) Professionally Qualified (IRS)** | | **1.3 FTE** |  | **102,900** |  |
|  | *Dr. T.P. Tiwari* | *60% @ 70,000USD* | *58,800* |  |  |
| *Dr. B Brown* | *70% @ 42,000USD* | *44,100* |  |  |
| **b) Salary-related On-Costs** | |  |  | **92,610** |  |
|  | *IRS* | *90% on IRS base salaries* | *92,610* |  |  |
| **c) Appointment Expenses** | |  |  | **0** |  |
| **d) Other Personnel (LRS)** | | **0.6 FTE** |  | **26,880** |  |
|  | *Research Assistant (to be shared with 'Roadmaps')* | *USD20,000 @ 60% and 60% on costs* | *26,880* |  |  |
| **Supplies and Services** | | | | | | **175,311** |
|  | **a) Research Operating Expenses** | |  |  | **95,149** |  |
|  | *General Operating costs - Nepal* | *5,000USD per staff member (includes Tamara’s Desk Space)* | *28,000* |  |  |
| *General operating costs - India* | *For administrative support* | *1,500* |  |  |
| *General operating costs - Bangladesh* | *For administrative support* | *1,500* |  |  |
| *Project Management Unit (GARS)* | *366 USD per month* | *6,149* |  |  |
| *Communications materials* | Workstream 3 | 10,000 |  |  |
| *Convergence and policy meetings* | *Workstream 1* | 10,000 |  |  |
| *Capacity development strategy workshops* | *Workstream 2* | 10,000 |  |  |
| *Closing events at end of project* | *Workstream 5* | 28,000 |  |  |
| **b.1) Short-term Consultants** | |  |  | **30,162** |  |
|  | Communications Consultant |  | 10,162 |  |  |
|  | Curriculum Development Expert |  | 10,000 |  |  |
|  | Other Required Consultants |  | 10,000 |  |  |
| **b.2) Collaborators** | |  |  | **50,000** |  |
|  | CIMMYT-NARC regional CASI platform |  | 50,000 |  |  |
| **b.6) Other Contracted Exp.** | |  |  | **0** |  |
| **Travel** | | | | | | **86,000** |
|  | **Fares / subsistence / Training** | |  |  | **86,000** |  |
|  | Final review meeting |  | 30,000 |  |  |
| Travel of CIMMYT staff for ACIAR review | AUD2,000 per staff member | 6,000 |  |  |
| Regional transport for CIMMYT staff |  | 30,000 |  |  |
| Strategy Workshops | *Workstream 5* | 10,000 |  |  |
| Research Trips and Expenses | *Workstream 4* | 10,000 |  |  |
| **Capital Items/Asset Usage** | | | | | | **24,369** |
|  | **Machinery Maintenance Budgets** | |  |  | **10,000** |  |
|  | **Other CGIAR fees** | |  |  | **14,369** |  |
| **Infrastructure Costs** | | | | | | **82,601** |
|  | **Indirect costs** | | 15% on CIMMYT held Funds |  | **76,211** |  |
| **Management on sub-grants** | | 5% on Collaborator funds |  | **6,390** |  |
| **Collaborators (4 to 6 TBC for remaining collaboration budget as per var 3 agreement)** | | |  | **127,803** |  |  |

1. We acknowledge the inputs provided under the lead of Dr Julian Prior and Dr Peter Brown for a scaling variation to the SFRSI proposal. [↑](#footnote-ref-2)
2. Quote from ‘Food Security and Poverty Reduction in the Eastern Gangetic Plains: A scoping study’ undertaken for ACIAR, July 2011. [↑](#footnote-ref-3)
3. These generalizations were confirmed in the districts targeted by this project through community surveys and key informant interviews conducted in the summer and fall of 2012 as part of SRAs granted to support project formulation. [↑](#footnote-ref-4)
4. Conservation agriculture (CA) commonly refers to farming systems where crops are produced without tilling the soil (zero tillage), with at least some of the residues (stubble) left on the soil surface, and with crop rotation. Conservation agriculture generally results in reduced production costs and soil degradation, leading to improved soil fertility and system productivity. CA needs to be tailored to different farming conditions and farmer circumstances. [↑](#footnote-ref-5)
5. Pretty and Bahrucha (2014) define sustainable intensification ‘….as a process or system where agricultural yields are increased without adverse environmental impact and without the conversion of additional non-agricultural land. The concept does not articulate or privilege any particular vision or method of agricultural production. Rather, it emphasizes ends rather than means…. The combination of the terms ‘sustainable’ and ‘intensification’ is an attempt to indicate that desirable out comes around both more food and improved environmental goods and services could be achieved by a variety of means.’ [↑](#footnote-ref-6)
6. ‘Research Priorities in Bangladesh Agriculture’ Eds. Hussain S.G. and Iqbal A. 2011. Bangladesh Agricultural Research Council, Agricultural Research Vision 2030 and Beyond. [↑](#footnote-ref-7)
7. While rice may be grown in both summer and winter in Bangladesh, in the north-west of the country 60-75% of the area is sown to other crops in the winter. [↑](#footnote-ref-8)
8. Three project communities will be in the high Barind Tract in the Rajshahi District. [↑](#footnote-ref-9)
9. Indian Council of Agricultural Research Vision 2030. http://www.icar.org.in/files/ICAR-Vision-2030.pdf [↑](#footnote-ref-10)
10. NARC’s Strategic Vision for Agricultural Research (2011-2030): Meeting Nepal’s Food and Nutrition Security Goals through Agricultural Science and Technology. Nepal Agricultural Research Council, June 2010. [↑](#footnote-ref-11)
11. *This project draws on the recommendations of the Scoping Study conducted for ACIAR in July 2011, and reported in the document ‘Food Security and Poverty Reduction in the Eastern Gangetic Plains’ as well as the partner consultations held in Delhi on October 3– 4th, 2012 to review the findings of community surveys and regional analysis that was supported through two SRAs and conducted in the summer and fall of 2012.*  [↑](#footnote-ref-12)
12. One of the principal benefits of CA is increased water use efficiency through improved water infiltration, increased water storage and reduced water losses by evaporation. [↑](#footnote-ref-13)
13. The PPPlab is a consortium of SNV, CDI Wageningen, PRC Erasmus University and Aqua4All: [www.ppplab.org](http://www.ppplab.org) [↑](#footnote-ref-14)
14. Recent studies of CIMMYT in South Asia indicate a major divide between genders in the services they use: men more frequently use knowledge intensive and formalized services such as service providers, machinery repair shops, banks etc. whereas women more frequently use cooperatives, micro-credit systems, NGO support etc.(M. Devare, pers. comm. Dec 6, 2013) [↑](#footnote-ref-15)
15. Change agents in our context refer to intermediaries such as service providers and input dealers whose actions reach large numbers of farmers (i.e. ‘one is to many relationships’) [↑](#footnote-ref-16)
16. The technological focus of the project will necessarily be determined by partners during the initial technical planning sessions of the project, heavily relying on the definition of problems enunciated by farmers in the initial surveys and rapid rural appraisals in the hub communities. [↑](#footnote-ref-17)
17. We do not recommend the use of highly toxic Paraquat for smallholder farmers, especially those using manual sprayers. [↑](#footnote-ref-18)
18. Simulation models provide the most rigorous approach to ex ante assessment of adaptation under different climate scenarios. Nevertheless, many models do not represent key technology interventions at the process level. On-farm technology performance data will be utilized for simulation model assessment and improvement. [↑](#footnote-ref-19)
19. http://katalyst.com.bd/ [↑](#footnote-ref-20)
20. The PPPlab is a consortium of SNV, CDI Wageningen, PRC Erasmus University and Aqua4All: [www.ppplab.org](http://www.ppplab.org) [↑](#footnote-ref-21)
21. See <http://www.newvision.co.ug/new_vision/news/1455055/agriculture-training-colleges-mainstream-courses-aflatoxins> for an article on the Ugandan Ministry who includes course units on aflatoxin in the school curriculum [↑](#footnote-ref-22)
22. To be assessed during steps 1-3, but potentially the following partners could be key implementing partners: Bangladesh – BARI/WRC, DAE and RDRS; India – UBKV, DoA WB, Satmile Club, SHGs; Nepal – NARC, DoA, FORWARD, Agrevolution (DeHaat model). [↑](#footnote-ref-23)
23. https://shambashapeup.com/ [↑](#footnote-ref-24)
24. Local E&PM = Evaluation and Planning Meetings held each season covering both districts of each state (India) or country (Bangladesh and Nepal) [↑](#footnote-ref-25)
25. Only applicable with the scaling out project. [↑](#footnote-ref-26)
26. Wheat grain equivalent i.e. lower production levels of higher value crops. [↑](#footnote-ref-27)
27. Pretty and Bahrucha (2014) define sustainable intensification ‘….as a process or system where agricultural yields are increased without adverse environmental impact and without the conversion of additional non-agricultural land. The concept does not articulate or privilege any particular vision or method of agricultural production. Rather, it emphasizes ends rather than means…. The combination of the terms ‘sustainable’ and ‘intensification’ is an attempt to indicate that desirable out comes around both more food and improved environmental goods and services could be achieved by a variety of means.’ [↑](#footnote-ref-28)
28. The PPPlab is a consortium of SNV, CDI Wageningen, PRC Erasmus University and Aqua4All: [www.ppplab.org](http://www.ppplab.org) [↑](#footnote-ref-29)
29. For example, total private sector investment in machinery was $1.68 Million (up to June’17) in Bangladesh in the CSISA MI project. Y4 investment is up by $ 68K on Y3’s (up to June’17) [↑](#footnote-ref-30)