The ACIAR Sustainable Development Investment Portfolio: Improving food, energy and water management for sustainable food systems in the Eastern Gangetic Plains
Sustainable Development Investment Portfolio:

Improving food, energy and water management for sustainable food systems in the Eastern Gangetic Plains

Tamara Jackson, Kuhu Chatterjee, Rebecca Cotton
The Australian Centre for International Agricultural Research (ACIAR) was established in June 1982 by an Act of the Australian Parliament. ACIAR operates as part of Australia's international development cooperation program, with a mission to achieve more productive and sustainable agricultural systems, for the benefit of developing countries and Australia. It commissions collaborative research between Australian and developing-country researchers in areas where Australia has special research competence. It also administers Australia's contribution to the International Agricultural Research Centres.

The use of trade names constitutes neither endorsement of nor discrimination against any product by ACIAR.

ACIAR TECHNICAL REPORTS SERIES

This series of publications contains technical information resulting from ACIAR-supported programs, projects and workshops (for which proceedings are not published); reports on ACIAR-supported fact-finding studies; or reports on other topics resulting from ACIAR activities. Publications in the series are available as hard copy, in limited numbers, and online from ACIAR's website at aciar.gov.au.

Jackson T, Chatterjee K and Cotton R (2023) Sustainable Development Investment Portfolio: Improving food, energy and water management for sustainable food systems in the Eastern Gangetic Plains, Australian Centre for International Agricultural Research, Canberra.

ACIAR Technical Report Series No. 98 (TR098)

© Australian Centre for International Agricultural Research (ACIAR) 2023

This work is copyright. Apart from any use as permitted under the Copyright Act 1968, no part may be reproduced by any process without prior written permission from ACIAR, GPO Box 1571, Canberra ACT 2601, Australia, aciar@aciar.gov.au.

ISSN 0816-7923 (print)
ISSN 1447-0918 (online)
ISBN 978-1-922787-90-3 (print)
ISBN 978-1-922787-89-7 (online)

Editing and proofreading by The Write Path
Design by Griffin Graphics
Printing by Instant Colour Press

Cover: A farmer working in a field in the Cooch Behar District of West Bengal
Photos: Conor Ashleigh
Foreword

The Australian Centre for International Agricultural Research (ACIAR) was mandated, as set out in the Australian Centre for International Agricultural Research Act 1982, to work with partners across the Indo-Pacific region to generate the knowledge and technologies that underpin improvements in agricultural productivity, sustainability and food system resilience. We do this by funding, brokering and managing research partnerships for the benefit of partner countries and Australia.

The ACIAR Sustainable Development Investment Portfolio (SDIP) program was a suite of projects designed to improve the management of water, energy and food resources in 3 major Himalayan river basins – the Indus, Ganges and Brahmaputra. It was funded by the Department of Foreign Affairs and Trade and comprised more than 20 long-term and short-term projects managed by a diverse network of ACIAR research partners. The program investigated the drivers and constraints that affect the development of sustainable food systems in the wider South Asia region. The ACIAR SDIP projects used long-term, gender-inclusive and highly collaborative approaches to understand and implement strategies which increase food security while reducing environmental impacts.

The second phase of the ACIAR SDIP program sought to share Australian expertise, to build and exchange knowledge, facilitate cooperation, and help improve the effectiveness of integrated policies and programs across the region, with an investment of $42 million between 2016 and 2021.

This ambitious program draws together the aims and results of a large array of projects. The results described in this Technical Report demonstrate the value of this approach, showing clearly that big thinking and a broad approach can deliver lasting results for smallholder farmers and their communities, now and into the future.

Andrew Campbell
Chief Executive Officer
ACIAR
# Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreword</td>
<td>iii</td>
</tr>
<tr>
<td>List of tables</td>
<td>viii</td>
</tr>
<tr>
<td>List of figures</td>
<td>viii</td>
</tr>
<tr>
<td>List of authors</td>
<td>ix</td>
</tr>
<tr>
<td>Co-contributors</td>
<td>ix</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>xi</td>
</tr>
<tr>
<td>Acronyms</td>
<td>xii</td>
</tr>
<tr>
<td>Units</td>
<td>xii</td>
</tr>
<tr>
<td>Summary</td>
<td>xiii</td>
</tr>
<tr>
<td><strong>Chapter 1: Introduction</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Chapter 2: Implementing the ACIAR SDIP program</strong></td>
<td>5</td>
</tr>
<tr>
<td>2.1 A phased approach</td>
<td>6</td>
</tr>
<tr>
<td>2.2 Phase 2 program framework</td>
<td>7</td>
</tr>
<tr>
<td>2.3 Reflections on the program approach</td>
<td>12</td>
</tr>
<tr>
<td>2.3.1 Transitioning from a project to program approach</td>
<td>12</td>
</tr>
<tr>
<td>2.3.2 Managing delays in timelines</td>
<td>12</td>
</tr>
<tr>
<td>2.3.3 Prioritisation, project and partner selection processes</td>
<td>12</td>
</tr>
<tr>
<td>2.3.4 Steering committee</td>
<td>13</td>
</tr>
<tr>
<td><strong>Chapter 3: Framing food systems using a ‘foresight’ approach</strong></td>
<td>15</td>
</tr>
<tr>
<td>3.1 Approach</td>
<td>15</td>
</tr>
<tr>
<td>3.1.1 Engaging with relevant actors and identifying motivation</td>
<td>16</td>
</tr>
<tr>
<td>3.1.2 Understanding the system of analysis: building the evidence base</td>
<td>17</td>
</tr>
<tr>
<td>3.1.3 Visions and scenarios</td>
<td>18</td>
</tr>
<tr>
<td>3.1.4 Influencing change</td>
<td>21</td>
</tr>
<tr>
<td>3.1.5 Summary lessons</td>
<td>22</td>
</tr>
<tr>
<td><strong>Chapter 4: Food systems in the Eastern Gangetic Plains</strong></td>
<td>25</td>
</tr>
<tr>
<td>4.1 Agricultural systems</td>
<td>25</td>
</tr>
<tr>
<td>4.2 Socioeconomic settings</td>
<td>26</td>
</tr>
<tr>
<td>4.3 Geopolitical economy</td>
<td>27</td>
</tr>
<tr>
<td>4.3.1 Bangladesh</td>
<td>28</td>
</tr>
<tr>
<td>4.3.2 India: Bihar and West Bengal</td>
<td>28</td>
</tr>
<tr>
<td>4.3.3 Nepal</td>
<td>29</td>
</tr>
</tbody>
</table>
4.4 Major drivers of food systems

4.4.1 Water
4.4.2 Climate change
4.4.3 Food trade in South Asia
4.4.4 Credit
4.4.5 Migration
4.4.6 Gender relations
4.4.7 Diet and nutrition

Chapter 5: Effective institutions to support sustainable food systems

5.1 Identifying effective institutional arrangements for intensification
5.2 Implementing processes for improving institutional effectiveness

Chapter 6: Better field–policy links for scaling

6.1 Scaling sustainable farming systems
   6.1.1 Proof of concept of CASI for the Eastern Gangetic Plains
   6.1.2 The science of scaling CASI systems
6.2 Scaling mechanisation in the Eastern Gangetic Plains
   6.2.1 Alternative mechanisation options: the Versatile Multi-crop Planter
   6.2.2 Value chain and policy interventions to accelerate adoption of the Happy Seeder
6.3 Summary

Chapter 7: An improved knowledge base to support food systems change

7.1 Sustainable groundwater development
   7.1.1 Access and availability
   7.1.2 Local water management options
   7.1.3 Understanding wider impacts of groundwater development through a food-energy-water lens
   7.1.4 Key lessons
7.2 Understanding the role of women in agriculture
   7.2.1 The big picture for women in agriculture
   7.2.2 Approaches to engaging and assessing benefits for women
   7.2.3 The impacts of farming systems change on women: gender positive outcomes
7.3 Promoting climate smart food production systems in the Eastern Gangetic Plains
   7.3.1 Climate change trends and impacts on agriculture
   7.3.2 Promoting conservation agriculture for mitigation and adaptation
   7.3.3 Avoiding emissions through better resource management
   7.3.4 Climate smart business opportunities
   7.3.5 Conclusion
7.4 Constraints to sustainable intensification in the Eastern Gangetic Plains
   7.4.1 Soil constraints
   7.4.2 Weed management
7.5 Locally relevant knowledge sharing mechanisms
    7.5.1 Syngenta Farmer Hubs in Bangladesh
    7.5.2 Supporting agriculture in the process of federalisation in Nepal

Chapter 8: Lessons for regional program approaches
8.1 Capitalising on working across locations
8.2 Working across scales
8.3 Multi-stakeholder engagement
8.4 Convergence with existing programs
8.5 Adaptations and innovations used to operate flexibly during COVID-19
8.6 The value of a program approach

Chapter 9: Impacts
9.1 Scientific impacts – now and in 5 years
9.2 Capacity impacts – now and in 5 years
9.3 Community impacts – now and in 5 years
    9.3.1 Economic impacts
    9.3.2 Social impacts
    9.3.3 Environmental impacts
9.4 Communication and dissemination activities

Chapter 10: Conclusion and opportunities for future work

Appendix A: Partnership approaches with DFAT and portfolio partners
Appendix B: Steering Committee members
Appendix C: Publications
References
List of tables

Table 1  ACIAR SDIP Phase 2 objectives, end of program target, and alignment with SDIP outcomes 3
Table 2  List of projects in ACIAR SDIP Phase 2 9
Table 3  Steering Committee members, with country and area of expertise 105

List of figures

Figure 1  The ACIAR SDIP program focus of the Eastern Gangetic Plains 5
Figure 2  The evolution of ACIAR SDIP, 2012–2021 6
Figure 3  ACIAR SDIP Phase 2 research framework 11
Figure 4  Foresight Framework (Woodhill and Hasnain 2019) 16
Figure 5  Partner estimates of the extent of uptake of various CASI practices by farmers across the Eastern Gangetic Plains (presented by location) 47
Figure 6  Awareness rates for each investigated technology from 2010 to 2021 by location 48
Figure 7  Pathway analysis for the zero till drill across the Eastern Gangetic Plains 49
Figure 8  System rice equivalent yield and system net income plotted against system specific energy across districts and tillage options under different cropping systems 74
Figure 9  Important considerations on the pathway to impact 90
List of authors

Tamara Jackson
School of Agriculture, Food and Wine
Faculty of Sciences, Engineering and Technology
The University of Adelaide

Kuhu Chatterjee
Australian Centre for International Agricultural Research, New Delhi, India

Rebecca Cotton
Formerly Australian Centre for International Agricultural Research, Canberra, Australia

Co-contributors

This report draws directly from the work and reporting of multiple individual ACIAR Sustainable Development Investment Portfolio (SDIP) projects, and recognises the following people as team members of those projects. We thank the original report authors for their contributions. We acknowledge that there may be other contributors to these projects not named, and we apologise for this omission.


Institutions to support intensification, integrated decision making and inclusiveness in agriculture in the East Gangetic Plain (LWR/2018/104): Professor Lin Crase, Dr Avinash Kishore, Professor Mohammad Jahangir Alam, Dr Bethany Cooper, Professor Jeff Connor, Professor Michael Burton, Professor Ismat Ara Begum, Dr Raj Banerjee, Dr Kartick Gupta, Professor Md Abdul Kader, Dr Paresh Kumar Sarma, Sophie Lountain, John Kandulu, Mohammad Rahman, Dr Anjani Kumar, Seema Bathla, K. Elumalai, Sunil Saroj.


Sustainable and Resilient Farming Systems Intensification – Variation 4 & 5 Learning from scaling (CSE/2011/077): The International Maize and Wheat Improvement Center (Brendan Brown, Mahesh Gathala, Manisha Shrestha, Anjana Chowdhury, Emma Karki, Pragya Timsina, Akriti Sharma, TP Tiwari); Uttar Banga Krishi Viswavidyalaya (AK Chowdhury, PM Bhattachrya, KK Das, T Dhar, B Mitra and A Ghosh); West Bengal Department of Agriculture (Sujan Sen, Rajat Chatterjee); Satmile Satish Club (Tapan Chowdhury, Amal Roy, Koushik Barman); Bihar Agricultural University (Sanjay Kumar, Ranvir Kumar, Ram Datt Mishra, Pawan Kumar Singh); iDE Global (Abir Ahmed Chowdhury, Farah Kazi Iqbal, Md. Nurul Amin); CSIRO (Peter R. Brown, Toni Darbas, Don S Gaydon, Alison M Laing, Perry L Poulton, Rick S Llewellyn); Bangladesh Agricultural
Research Institute (Md. Shakhawat Hossain); Rangpur Dinajpur Rural Development Society (Mamunur Rashid, Anup Kumar Ghosh); Nepal Department of Agriculture (Ram Khrishna Shrestha); and the University of Western Australia (Fay Rola-Rubzen).


Pilot project on commercialisation of the Virtual Multi-Crop Planter in Bangladesh (LWR/2018/111): Professor Dr Richard W Bell, Dr Enamul Haque Md, Mizanul Hoque, Hoque Corporation; Dr Hamidul Islam Md, Bangladesh Agricultural University; Ali Haider Mortuza Md, National Bank Limited; Liakot Ali Khan Md, CASPA.


Political economy analysis of cross border agricultural trade in Bangladesh, India and Nepal: Aditya Pillai and Sagar Prasai.

Regional scale water impacts (WAC/2019/104): Mohammed Mainuddin, Mohammad A Mojid, Michael Scobie, Don Gaydon, Mac Kirby, Sreekanth Janardhanan, Jorge Pena-Arancibia, Sumant Kumar, Phil Davies, Erik Schmidt, Surjeet Singh, Dave Penton.

Unravelling the WEF nexus in WB, India. Does increased access to groundwater irrigation through electricity reforms affect equity and sustainability outcomes? (WAC/2019/151): Aditi Mukherji, Marie-Charlotte Buisson, Archisman Mitra, Partha Sarathi Banerjee, Sujata Das Chowdhury.

Role of groundwater in agrarian change in West Bengal and Bangladesh: A comparative analysis: Aditi Mukherji, Marie-Charlotte Buisson, Archisman Mitra, Anindita Sarkar, Yashodha Yashodha.


Aquifer characterisation, artificial recharge and reuse of suddenly available water in south Bihar (WAC/2018/211): Dr Prabhakar Sharma, Dr Somnath Bandyopadhyay, Dr Aviram Sharma, Dr Kishore Dhavala.


Pilot study on knowledge transfer mechanism for effective agriculture extension services in Nepal: Centre for Green Economic Development, Nepal, Madhav Karki; CDAFN.
Acknowledgements

Funding for this work came from the Department of Foreign Affairs and Trade (DFAT) Sustainable Development Investment Portfolio (SDIP), with additional funds provided by ACIAR. Within ACIAR, the SDIP had multiple research program managers, including Drs John Dixon, Ejaz Qureshi, Eric Huttner and Robyn Johnston, who provided the vision for and oversight of the program. From DFAT, SDIP advisers Kate Hayes, Jim Woodhill and Brian Dawson were very engaged in understanding and contributing to the program, and we thank them for their input. We acknowledge the work of the many project teams that contributed to the program, and the wider network of farmers, extension agents, value chain actors and policymakers who engaged in project activities, all of whom contributed to a better understanding of the food-energy-water nexus in the Eastern Gangetic Plains.
## Acronyms

<table>
<thead>
<tr>
<th>Shortened term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACIAR</td>
<td>Australian Centre for International Agricultural Research</td>
</tr>
<tr>
<td>ASEAN</td>
<td>Association of Southeast Asian Nations</td>
</tr>
<tr>
<td>AUD</td>
<td>Australian dollar</td>
</tr>
<tr>
<td>CASI</td>
<td>Conservation Agriculture based Sustainable Intensification</td>
</tr>
<tr>
<td>CASPA</td>
<td>Conservation Agriculture Service Providers Association</td>
</tr>
<tr>
<td>CIMMYT</td>
<td>International Maize and Wheat Improvement Center</td>
</tr>
<tr>
<td>CO₂</td>
<td>Carbon dioxide</td>
</tr>
<tr>
<td>CO₂-e</td>
<td>Carbon dioxide equivalent</td>
</tr>
<tr>
<td>CSIRO</td>
<td>Commonwealth Scientific and Industrial Research Organisation</td>
</tr>
<tr>
<td>DFAT</td>
<td>Department of Foreign Affairs and Trade</td>
</tr>
<tr>
<td>GDP</td>
<td>gross domestic product</td>
</tr>
<tr>
<td>INR</td>
<td>Indian Rupee</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-Government Organisation</td>
</tr>
<tr>
<td>NITI Aayog</td>
<td>Policy Commission, Government of India</td>
</tr>
<tr>
<td>SAARC</td>
<td>South Asian Association for Regional Cooperation</td>
</tr>
<tr>
<td>SDIP</td>
<td>Sustainable Development Investment Portfolio</td>
</tr>
<tr>
<td>SRFSI</td>
<td>Sustainable and Resilient Farming Systems Intensification</td>
</tr>
<tr>
<td>USD</td>
<td>United States dollar</td>
</tr>
<tr>
<td>VMP</td>
<td>Versatile Multi-crop Planter</td>
</tr>
</tbody>
</table>

## Units

<table>
<thead>
<tr>
<th>Unit</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ha</td>
<td>hectare</td>
</tr>
<tr>
<td>kg</td>
<td>kilogram</td>
</tr>
<tr>
<td>km</td>
<td>kilometre</td>
</tr>
<tr>
<td>m</td>
<td>metre</td>
</tr>
<tr>
<td>t</td>
<td>tonne</td>
</tr>
</tbody>
</table>
Summary

The ACIAR Sustainable Development Investment Portfolio (SDIP) program goal is to **maximise agriculture’s contribution to sustainable food systems in the Eastern Gangetic Plains**, for improved food, energy and water security. Over 8 years, the program has transitioned from understanding and promoting sustainable farming technologies based on conservation agriculture, to include the wider context of the food system and a deeper understanding of the various external factors that influence sustainable food production. ACIAR SDIP has focused on sustainable food systems as a way of integrating different sectors at a range of scales, and ensuring gender-inclusive planning processes and outcomes. The aim was to promote resilient and inclusive food systems supported by robust institutional arrangements, policies and strategic regional planning, to address the challenge of scaling sustainable and inclusive farming systems in the context of a changing food system.

In Phase 1, the Sustainable and Resilient Farming Systems Intensification (SRFSI) project tested and promoted sustainable farming systems based on Conservation Agriculture based Sustainable Intensification (CASI). This allowed work in Phase 2 to focus on what was needed in the wider enabling environment to allow these systems to be used at scale; to understand the big drivers of food systems in the Eastern Gangetic Plains, and how these impact on farming systems. In Phase 2, the ACIAR SDIP program worked with a wide range of stakeholders from policymakers and implementers, including food policy and gender researchers to understand constraints to, and impacts of, scaling sustainable farming systems. This included deepening understanding of how institutional and social factors, markets and technologies interact to constrain or enable the adoption of sustainable intensification technologies. Additional work explored biophysical constraints such as soil and weed dynamics, and a better understanding of the context for water and energy resources management. The growing challenges of climate change, and the need to promote gender equality by empowering women and girls, are themes that were integrated in activities across the program.

Highlights from the ACIAR SDIP program include:

**Scaling of CASI approaches, with an increasingly nuanced understanding of the science behind the scaling.** CASI farming practices increase productivity and farm incomes, reduce labour requirements and farm level water use, and have emission reduction benefits. In total, around 120,000 farmers (25% female) are now using more productive, profitable and gender-inclusive farming systems. The cumulative impacts of this adoption over the life of SDIP includes an estimated additional AUD100 million in farm household income, 60,000 tonnes of CO\textsubscript{2}-e mitigated and 63,000 megalitres of water saved, and positive benefits for women in households using CASI. Importantly, CASI is now integrated into state government programs and policies in West Bengal, and will continue to scale without project support.
Helping our partners to bring together the ‘big picture’ related to sustainable food systems through application of foresight processes in the Eastern Gangetic Plains. This work has included engaging key stakeholders in informed dialogue on the drivers and trends for regional food, water and energy security through enhanced foresight and scenario processes; synthesising the current status of key influencing factors and their potential future trajectories; and using future-focused processes at the local level as a dialogue tool to probe deeper into existing situations, and to determine future pathways for food systems transformation.

Exploring effective institutional arrangements to support sustainable food systems. A better understanding has been generated about the current alignment of policies and delivery mechanisms related to knowledge transfer, risk management, water rights, and inclusion and empowerment. Knowledge transfer to farmers, especially on new technologies, offers promise on multiple fronts, but its benefits are not universally accessible because of the delivery apparatus, with women particularly disadvantaged but (ironically) having much to gain from better transfer mechanisms (like mobile phones). Water access in the region is intimately tied to energy and the incentives for using energy differently. Leveraging diverse preferences around pumping technologies offers promise for further developing groundwater markets and widening water access. Policies that are seemingly focused on risk reduction (for example, input subsidies, energy policies) are producing perverse impacts and require a rethink in terms of how they are rolled out. Additional international support around broadening better governance and financing systems can have important benefits in agriculture. In Nepal, the Roadmaps process has proved to be an effective institutional process connecting farmers’ groups, policymakers, machinery owners and scientists to improve agricultural productivity in Province 1 and 2, which have the potential to be the food bowl of Nepal. This project addressed a key demand for mechanisms to promote coordination and develop a plan for agricultural machinery use that supports CASI technologies.

Creating new approaches to research and new knowledge which promotes a more nuanced macro and micro understanding of women’s roles in agriculture in the Eastern Gangetic Plains, and the impacts of systems change. This research challenges policymakers, academics and donors to ensure they target their interventions based on an appreciation of both the macro and micro drivers which affect the success of women farmers. Several projects have contributed to a better understanding of the role of women in agriculture, highlighting the heterogeneous situation across the Eastern Gangetic Plains. A chief concern is the low female workforce participation in Bihar and West Bengal, which has declined to as little as 10% in some districts. Other work has looked at how inclusive CASI approaches are, finding that it reduces women’s workloads, and offers opportunities to diversify into alternative income generating activities.

Contributing new knowledge to support sustainable groundwater development in the Eastern Gangetic Plains, using a food-energy-water nexus lens. Individual projects have looked at patterns of availability and access to groundwater, local level water management solutions (such as CASI managed aquifer recharge), and the impacts of commonly used policies that aim to influence groundwater development and sustainability. Results indicate the links are not always as expected. For example,
increased access to electricity has not resulted in a strong change in groundwater use or productivity in West Bengal; and water savings at the farm scale do not always result in reduced groundwater use overall. In the Eastern Gangetic Plains, impacts of climate change will result in delayed monsoons and increased incidence of flooding, which makes summer crops more vulnerable to water stress (both too much and too little). Groundwater resources, which in many places are annually recharged (as at least 4 ACIAR SDIP studies have confirmed), are more resilient to climate change and offer assured irrigation in the dry winter months.

**Identifying options that contribute to mitigation of emissions and adaptation to climate change.** CASI-based systems reduce the emissions footprint of food production systems in the Eastern Gangetic Plains by 6 to 18%. Emissions reductions vary by cropping system, and so any changes to the cropping system can have wider impacts on the carbon intensity of the agricultural sector. There is potential for significant impact if these systems are adopted widely; for example, increasing the use of CASI to 20% of the area of rice, wheat and maize systems in the Eastern Gangetic Plains would reduce carbon emissions by over 740,000 tonnes of CO₂-e. CASI systems also have a positive impact on both the amount and types of carbon present in the upper soil layers. Identifying and managing soil acidity through better management of nitrogen fertiliser also has potential to reduce emissions. Importantly, these reductions do not need to come at the expense of productivity or profitability, creating win-win situations for farmers, rural agribusinesses and governments alike, which are all struggling to find ways to adapt to climate change and reduce future levels of emissions.

**Developed new knowledge on the challenges and opportunities for Nepal’s food systems in the context of federalisation.** The changed federal structure gives more power to local governments at the municipal level, adds a provincial level of government for facilitation and support, and changes the role of the federal government to policy, governance, knowledge and oversight issues. This restructuring brings enormous opportunities for agriculture sector services to be prioritised and managed at the local level, but a coordinated and cooperative mechanism is essential for success. Work has been undertaken to define the context, and understand priorities at different levels of government, to reach a consensus on preferred pathways towards sustainable food systems. In particular, there has been a focus on planning for sustainable agricultural mechanisation by offering a linking mechanism for one part of the agricultural system at the provincial level; and on enhancing linkages within the extension system.

The ultimate goal of the ACIAR SDIP program was to engage in applied research that promotes agricultural development in a sustainable and equitable way, so that future food systems can provide what is needed while still working within sustainable extraction limits.