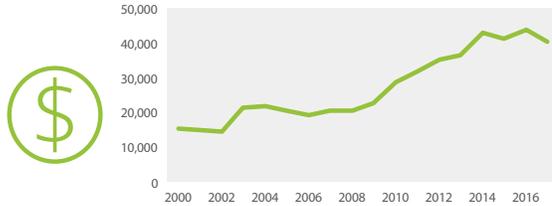




CAMBODIA

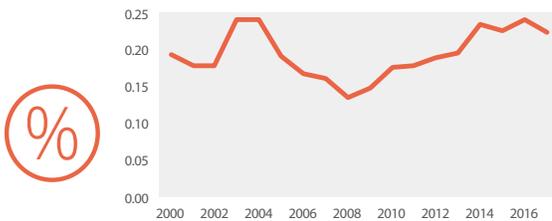
Gert-Jan Stads, Pol Chanthy, Alejandro Nin-Pratt, Norah Omot, Nguyen Thi Pham, and Ouk Makara

AGRICULTURAL RESEARCH SPENDING



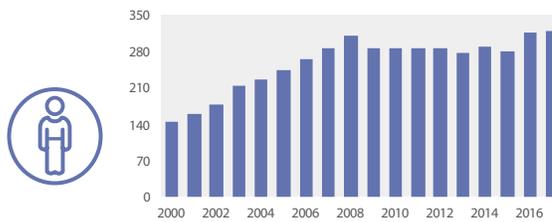
	CAMBODIA	LAOS	THAILAND	VIETNAM
Million riel (2011 constant prices)	40,630.0			
Million PPP dollars (2011 constant prices)	30.2	19.3	847.2	177.6

SPENDING INTENSITY



Agricultural research spending as a share of AgGDP	0.22%	0.26%	0.94%	0.20%
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AGRICULTURAL RESEARCHERS



Full-time equivalents	319.0	203.2	2,911.4	4,250.1
Share of researchers with MSc and PhD degrees	45%	47%	50%	67%

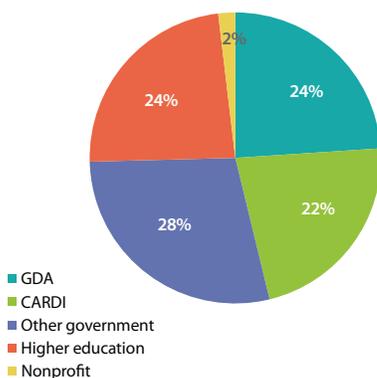
Notes: Data in the table above are for 2017. Information on access to further resources, data procedures and methodologies, and acronyms and definitions is provided on page 8. See www.asti.cgiar.org/cambodia/directory for an overview of Cambodia's agricultural R&D agencies.

▶ Despite a considerable increase in agricultural research spending in recent years, Cambodia is still grossly underinvesting. At just 0.22 percent in 2017, the country's agricultural research intensity ratio (that is, spending as a share of AgGDP) is very low.

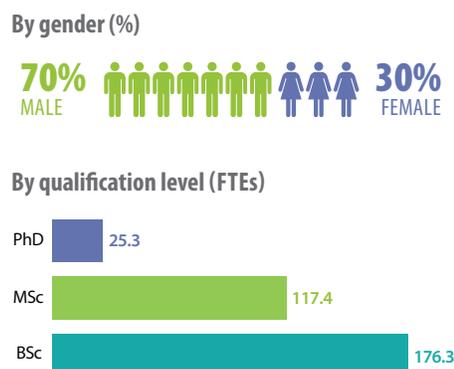
▶ The country's researcher numbers have steadily increased over time; however, only a small fraction of these researchers are PhD-qualified, and training opportunities are limited.

▶ The Cambodian agricultural research system is highly fragmented. It is intended that the proposed Cambodia Academy of Agricultural Science, which is in the advanced planning stages, will address this issue.

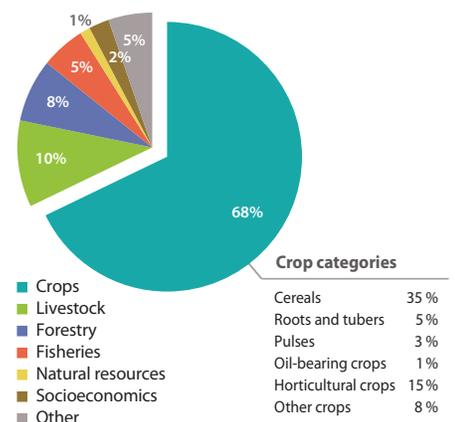
INSTITUTIONAL PROFILE, 2017



RESEARCHER PROFILE, 2017



RESEARCH FOCUS, 2017



CHALLENGE

- ▶ Average qualification levels of Cambodian agricultural researchers are among the lowest in the world. In 2017, the country as a whole employed only 25 PhD-qualified agricultural researchers (in FTEs), which is insufficient for the research system to have a tangible impact on agricultural productivity growth and poverty reduction. Moreover, researchers have minimal opportunities to pursue postgraduate training either at home or abroad.

POLICY IMPLICATIONS

- ▶ Strengthening agricultural research capacity is imperative and will depend on the country's ability to attract and retain well-qualified researchers by offering more competitive salaries and benefits. Government commitments are needed to address structural issues in the higher education system to enable national universities to offer a broader range of programs, disciplines, and subjects. In addition to more secure and consistent funding, the country's agencies also need a clearly defined and coordinated training and mentoring strategy to make agricultural research a more attractive career path.

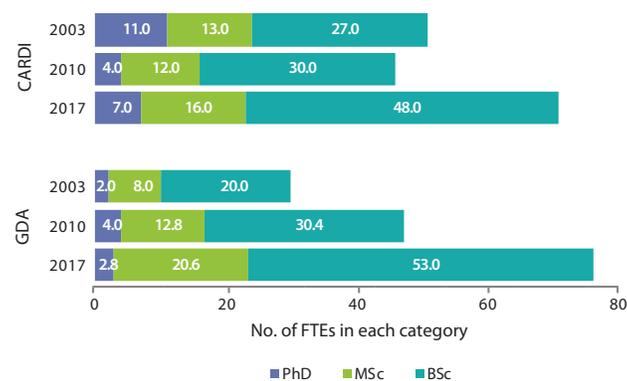
Agricultural researchers by degree level, 2017

SECTOR/AGENCY	PhD	MSc	BSc	TOTAL
Government				
CARDI	7.0	16.0	48.0	71.0
CRRJ	1.0	9.0	14.0	24.0
GDA	2.8	20.6	53.0	76.4
FWRI	1.6	12.8	9.6	24.0
IFReDI	1.5	7.5	13.5	22.5
NAHPRI	7.8	5.5	12.7	20.0
Higher education				
Royal University of Agriculture	9.0	28.2	10.5	47.6
Prek Leap National School of Agriculture	0.6	6.8	10.5	17.9
Kampong Cham National School of Agriculture	—	4.7	3.5	8.1
University of Battambang	1.0	1.8	1.8	4.6
Chea Sim University of Kamchaymear	—	1.5	—	1.5
Nonprofit				
Cambodia Development Resource Institute	—	5.0	1.0	6.0
TOTAL	25.3	117.4	176.3	319.0

Note: Values shown in *italic* have been estimated.

- ◀ Of the 319 FTEs involved in agricultural research in Cambodia in 2017, just 25 were PhD-qualified and 117 MSc-qualified. Average degree levels were higher at RUA than at the other government and higher education agencies. In 2017, CARDI employed just 7 scientists with PhD degrees and 16 with MSc degrees, which represents extremely small numbers compared with many similarly sized national agricultural research institutes across the Asia–Pacific region. Moreover, it is important to note that many of the PhD-qualified staff at CARDI, GDA, and the other agencies actually hold management positions and therefore conduct very little research.

Agricultural researchers by degree level, 2003, 2010, and 2017



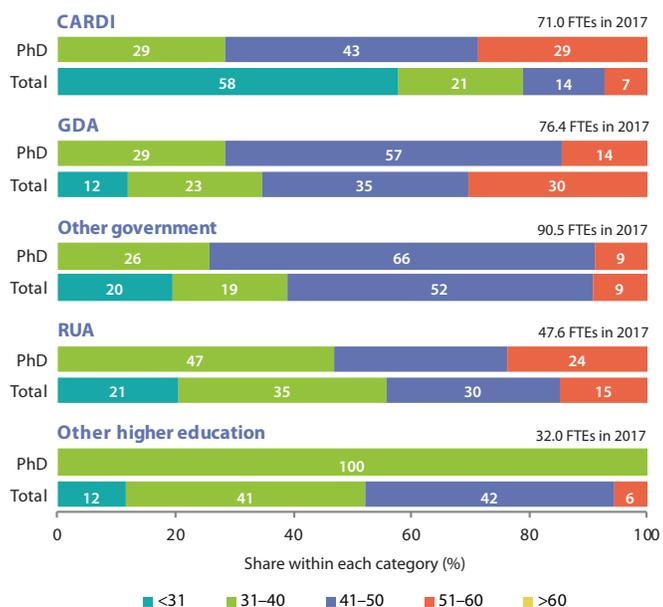
- ◀ The total number of researchers at CARDI and GDA, Cambodia's two largest agricultural R&D agencies, has steadily risen over time. However, most of the increased capacity occurred at the BSc-degree level. Both agencies still lack a critical mass of researchers with postgraduate degrees, highlighting the need for further training.

Notes: Data exclude expatriate researchers who were active at CARDI in 2003. GDA has a very broad mandate covering agricultural support services, regulatory affairs, trade facilitation, research, and extension. Quantifying exact researcher numbers was not possible; it was estimated that, for GDA's 382 professional staff with PhD, MSc, and BSc degrees, 20 percent of their time on average would be spent on research.

CHALLENGES TO ATTRACT AND RETAIN SCIENTISTS

- ▶ Agricultural scientists do not consider Cambodia's agricultural research agencies to be attractive employers, mainly because salary levels are two to ten times lower than those offered by the private sector or nongovernmental organizations. In the current government salary system, nothing distinguishes research from nonresearch staff, nor a PhD-qualified employee from one with a BSc degree. This clearly acts as a major disincentive for pursuing both a career in science at a government institution or postgraduate-level training. Given these constraints, many young and talented agricultural scientists have left—and continue to leave—government institutions in pursuit of more lucrative opportunities elsewhere. Even young scientists who have benefited from overseas PhD training often leave CARDI within one or two years of their return—despite being contractually obliged to remain employed for at least four years after completing overseas training. It is imperative for staff contracts to be more strictly enforced in the future. The Ministry of Agriculture, Forestry, and Fisheries and the Ministry of Economy and Finance are currently working on an incentive system for researchers. Once in place, this should remedy the exodus of qualified scientists.

Agricultural researchers by age bracket, 2017



► Cambodia's pool of agricultural researchers is relatively young. As of 2017, more than half the country's agricultural researchers were in their 20s or 30s. Although the average age of PhD-qualified researchers is higher, Cambodia is not challenged with an aging pool of senior researchers approaching retirement age (as is the case in Indonesia, Malaysia, and Thailand, for example). In fact, Cambodia's extremely young pool of agricultural researchers represents an important opportunity. With well-targeted on-the-job and formal postgraduate training, the country is strongly positioned to build a highly qualified pool of scientists serving a wide range of domains for decades.

CAPACITY STRENGTHENING INITIATIVES

► As of November 2019, three CARDI researchers were pursuing PhD training overseas. Two of them were located in South Korea undertaking PhD training in plant breeding and soil science, and one was located in Australia undertaking a PhD degree in soil science. In addition, two CARDI scientists were pursuing MSc training (in Japan and at RUA). Although the return to CARDI of these newly trained staff will certainly strengthen CARDI's capacity, much more training is needed in the coming years to address the Institute's most pressing vacancies for plant pathologists, plant physiologists, horticulturalists, natural resource management specialists, and food and nutrition scientists, all of which are very difficult positions to fill. Overseas training is costly, and in-country training opportunities are scarce. During 2013–2018, only two agricultural scientists obtained a PhD degree from RUA (148 obtained MSc degrees), while the national schools of agriculture of Prek Leap and Kampong Cham only offer BSc-level training. It is important for the government to invest in higher agricultural education to enable the country's universities to increase the number and size of their MSc and PhD programs and to improve existing curriculums.

INSTITUTIONAL REFORM OF CAMBODIA'S AGRICULTURAL RESEARCH SYSTEM

► Cambodia's agricultural research system is fragmented. It consists of a number of units that sometimes have overlapping mandates; are of suboptimal scale; lack resources in terms of funding, qualified personnel, and research infrastructure; and operate at a distance from potential end-users. Tackling these issues and making the research system more coherent and effective requires major institutional reform. To this end, the government has developed a draft plan to merge the crop (CARDI), livestock (NAHPRI), forestry (FWRI), fisheries (IFReDI), and rubber (CRRI) research institutes into a single entity: the Cambodia Academy of Agricultural Sciences. This merger is widely supported by all five institutes, and the establishment of the academy is included in the Cambodian government's strategic plan for 2018–2023. The merger, which is likely to occur in the next few years, is expected to improve research coordination and prioritization and produce major economies of scale and scope through resource sharing.

One important government organization that is not part of these institutional reforms is GDA. As previously mentioned, GDA has a very broad mandate and is mainly focused on performing technical, regulatory, and coordination functions related to food safety and food security on behalf of the Ministry of Agriculture, Forestry, and Fisheries. GDA is also highly active in the provinces, where it works closely with the Provincial Departments of Agriculture, Forestry, and Fisheries on applied research and extension. In fact, even though research is not its main mandate, GDA is the country's largest agency in terms of agricultural research staff and spending. Yet, CARDI's and GDA's research mandates overlap to a considerable extent. Both agencies would benefit tremendously from greater coordination, rationalization, and efficient allocation of their research and resources (both in terms of staff and infrastructure). A clear, nationwide master plan for agricultural research is needed to address these inefficiencies and enhance cooperation.

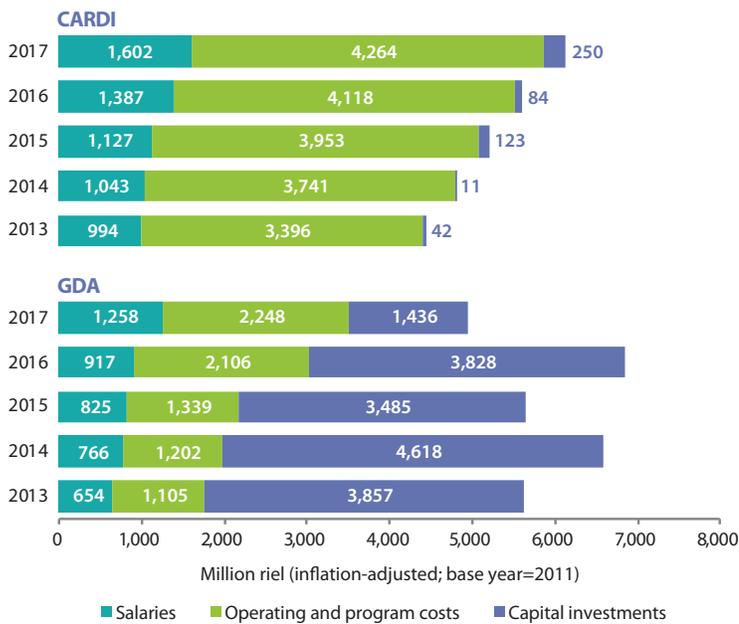
CHALLENGE

- ▶ Despite the steady rise in agricultural research spending since 2000, Cambodia is still underinvesting. In 2017, spending on agricultural R&D represented only 0.22 percent of the country's AgGDP, which is low considering Cambodia is facing rapid population growth, high levels of poverty and malnutrition, and relatively low agricultural productivity—all in the context of climate change.

POLICY IMPLICATIONS

- ▶ In its Agriculture Strategic Development Plan for 2019–2023, the government recognized the important role of agricultural R&D in increasing productivity and diversifying the agricultural sector. It is important, however, for this commitment to be translated into higher and sustainable funding for R&D agencies—not just for research programs, but also for much-needed upgrades to infrastructure and higher researcher salaries. Diversification of funding should also be promoted through a more enabling policy environment that stimulates private funding, which has largely remained untapped to date.

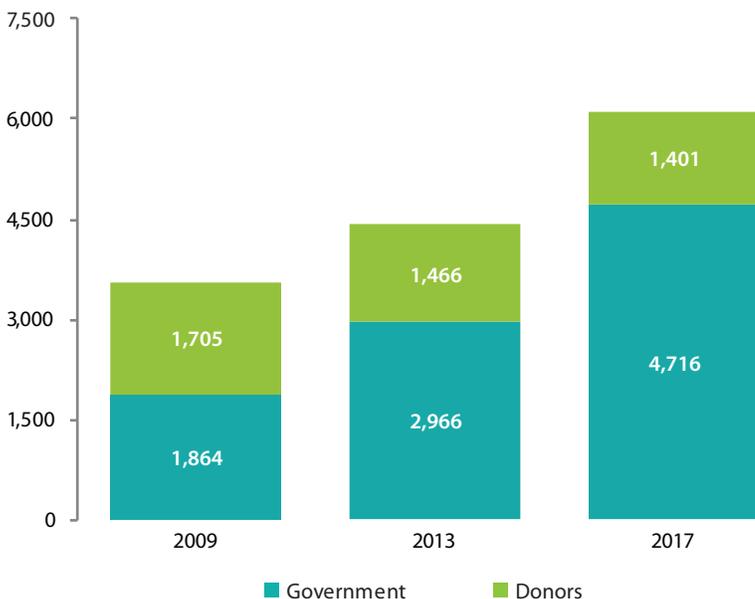
CARDI's and GDA's research expenditures by cost category, 2013–2017



- ◀ CARDI's spending rose progressively during 2013–2017, while GDA's spending followed a more erratic trend over time. Overall, salary costs accounted for roughly a quarter of CARDI's spending, but just 15 percent of GDA's. A major difference between the two agencies' spending allocations is the very high level of capital investment at GDA compared with CARDI. In recent years, GDA renovated its headquarters in Phnom Penh and many of its research stations, it constructed a new plant protection laboratory, and made important investments in equipment and information and communications technologies. In contrast, CARDI's capital investments have been minimal, and outdated equipment and facilities are increasingly compromising the volume and quality of its research outputs.

CARDI's funding sources, 2009–2017

Million riel
(inflation-adjusted; base year = 2011)

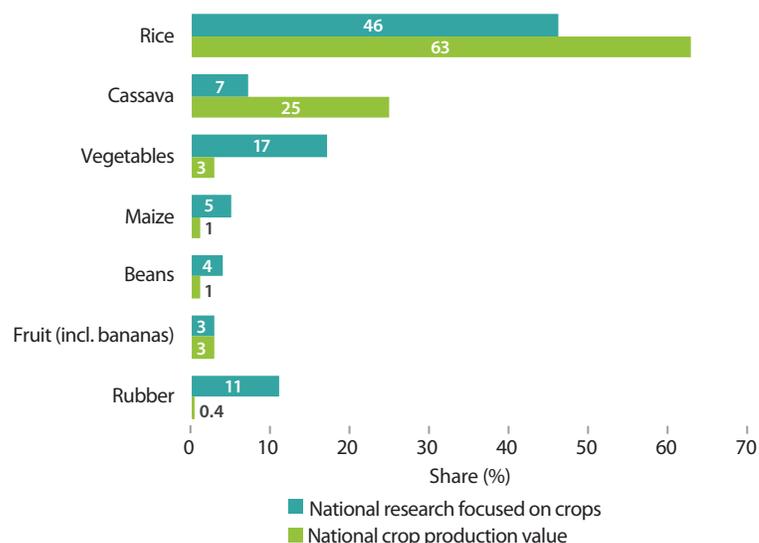


- ◀ Funding to CARDI increased by more than 70 percent during 2009–2017. The composition of this funding has also changed considerably over time. In 2009, nearly half of CARDI's funding came from donors, with the government funding the remainder. Over time, however, the institute's donor dependence has progressively diminished. ACIAR is CARDI's most important donor by far. About three quarters of all the donor funding that CARDI receives comes from ACIAR.

DONOR FUNDING

- ▶ ACIAR has been the largest and most consistent donor of agricultural research in Cambodia over time. The Centre has supported a wide range of projects on crop breeding, crop production systems, soil fertility, postharvest handling, animal productivity, forestry market opportunities, aquaculture development, and agricultural extension services. ACIAR funding used to be directed to CARDI only, but in recent years ACIAR has partnered with other agencies as well.
- ▶ Other donors to CARDI include the Rural Development Administration (South Korea), the McKnight Foundation (United States), and the Nippon Foundation (Japan). Compared with aid from Australia, projects funded by these donors tend to be ad hoc and much smaller (typically around US\$10,000 per project).
- ▶ Since 2014, the International Fund for Agricultural Development has supported an Agriculture Services Program for Innovation, Resilience, and Extension. Although the program mostly focuses on strengthening Cambodia's extension system, some funding has been allocated to RUA and GDA for policy research.
- ▶ The United States Agency for International Development is an important donor to RUA. It funds several projects to advance food safety and horticultural production as part of its Feed the Future program. Other donors funding RUA's research include the European Union, ACIAR, the Japan International Cooperation Agency, South Korea's Rural Development Administration, the government of Sweden, and the World Organisation for Animal Health.
- ▶ The Asian Development Bank and the World Bank have assisted the Cambodian agricultural sector through various loans and grants financing research laboratories and other upgrades to infrastructure.

Congruence between agricultural research and production value for selected commodities 2016/2017



◀ Cambodia's crop sector is not diversified. In 2016, just two crops (rice and cassava) accounted for 88 percent of the country's total crop production value. Recognizing this imbalance, the national government set the goal of diversifying agricultural production away from rice and cassava in favor of more high-value commodities. This shift is already visible in the country's research agenda: as of 2017, in an effort to boost future productivity and competitiveness on international markets, comparatively more resources were being allocated to vegetable and rubber research than congruence with their production values alone would indicate.

Source: Data on crop production values are from [FAOSTAT](#).
Notes: Data on crop production values are for 2016; data on research focus are for 2017.

DIVERSIFYING AGRICULTURAL PRODUCTION

- ▶ Of Cambodia's rural population, 46 percent (or 3 million people) still rely on agriculture for employment. In recent years, however, agricultural value added has undergone very little growth, raising concerns about the sector's ability to provide livelihoods moving forward. Expansion in the land under cultivation has been the major driver of increased production since 2000. This cannot continue indefinitely, and the government realizes that future growth is highly dependent on intensification and added value through improved yields and diversification into high-value crops and other agricultural products, including livestock farming and aquaculture ([World Bank 2018](#)). Modernization of the crop sector and its diversification is based on technology's substantial contribution, which requires considerable investments in research, extension, and education. The government's Agricultural Sector Strategic Development Plan recognizes this. It promotes private investment, which is essential to the development of agro-industrial activities that require significant capital investment. Economic Land Concessions have already been granted to establish plantations to grow rubber, sugarcane, cassava, palm oil, cashews, and acacia trees. A key remaining challenge is to ensure that farmers and agribusinesses can access and adopt technology to improve value added in crop production. It is therefore essential that access to the required technical assistance (extension services), financial services, and public infrastructure (such as roads and telecommunications) be enhanced.

Number of articles in international journals by CARDI's researchers, 2013–2017

	2013	2014	2015	2016	2017
Number of articles	4	8	6	5	2
Number of articles per FTE researcher	0.07	0.12	0.11	0.07	0.03

- ◀ The publication record of CARDI's researchers is extremely low by international standards, as well as being much lower than in neighboring Laos, Thailand, or Vietnam. During 2013–2017, a total of 25 articles authored by CARDI's scientists were published in international journals, which averages less than 0.1 article per researcher per year.

KEY CHALLENGE

- ▶ Agricultural production and productivity have shown impressive growth since 2000. The 2020s will be more challenging, however, given that the prices of many of Cambodia's commodities are falling. The easiest approach to increasing production (that is, expanding land area) has been fully exploited. Future acceleration of agricultural growth will be highly dependent on technical change, but to date the innovative capacity of the country's R&D system has been limited (in terms of research outputs).

POLICY IMPLICATIONS

- ▶ To stimulate future growth of the agricultural sector and to improve its position in global value chains, Cambodia will have to rely more on productivity gains driven by innovation. A considerable increase in R&D investment accompanying this shift is required to strengthen and, at the same time, streamline the innovation system. The unified national agricultural research system under the proposed Cambodia Academy of Agricultural Science is an important step in the right direction to address institutional inefficiencies. In addition, increased involvement of farmers and agribusiness companies in the design of the research agenda and the development of improved varieties will be critical.

New varieties released by CARDI, 2013–2017

CROP	2013	2014	2015	2016	2017	TOTAL
Rice	1	—	3	1	1	6
Maize	—	—	1	—	—	1

- ◀ During 2013–2017, CARDI released seven new crop varieties, six of which were rice varieties and one of which was a maize variety. Despite the relative importance of cassava, beans, and horticultural crops in CARDI's research agenda, no new varieties for these commodities were released in recent years. Overall, the release of new crop varieties is much lower in Cambodia than in most other countries in Southeast Asia, raising questions as to the innovative capacity of the country's agricultural R&D.

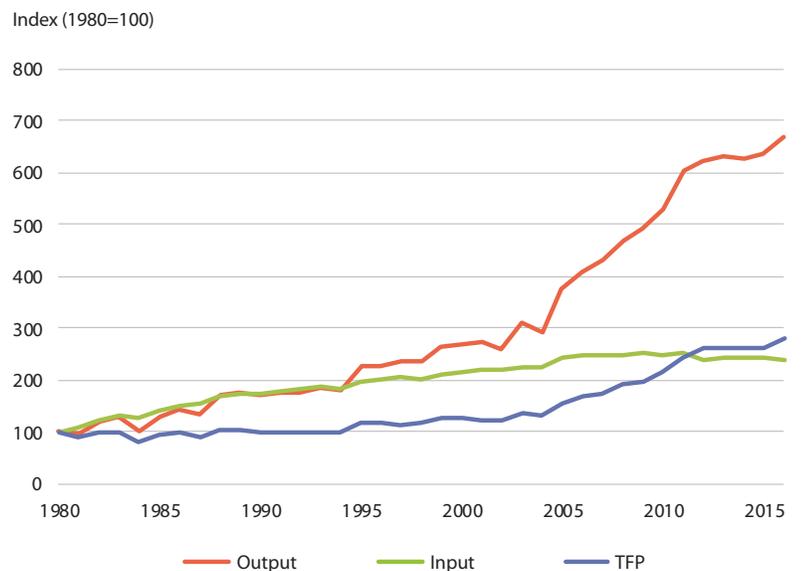
AGRICULTURAL PRODUCTIVITY GROWTH

- ▶ A significant share of Cambodia's past agricultural production growth was driven by an expansion of cultivated area and diversification of production away from rice in favor of cassava and fruit. Concerns about the future of Cambodia's farming are considerable, given that the capacity to spread into new land area has virtually been exhausted and global prices for the commodities Cambodia produces are falling. With the two main drivers of historical growth in agricultural production lost, the country needs to find new pathways to ensure growth into the future and to continue to address rural poverty. With agriculture already moving toward more diversification and higher value added in production, a rise in productivity and efficiency would have the largest positive effect on farm incomes, especially if the shift from traditional to modern technologies were accompanied by increased use of irrigation, improved seed, and fertilizer.

In this context, increasing total factor productivity (TFP) of agricultural production—that is, getting more output from the same amount of resources—is critical for sustaining agricultural growth in Cambodia. TFP is an indicator of how efficiently agricultural land, labor, capital, and other inputs (seed, fertilizer, and so on) are used to produce a country's agricultural outputs (crops, livestock, and so on). TFP is calculated as the ratio of total agricultural outputs to total production inputs, so when more output is produced from a constant amount of resources, TFP increases. R&D activities produce new technologies, and innovation is a crucial factor in driving TFP, along with technological spillovers from other countries, higher numbers of skilled workers, investments that favor the development of input and output markets (such as roads and communications), and government policies and institutions that promote market development and competition.

Average yearly growth in Cambodia's agricultural output reached nearly 5 percent during the 1990s, accelerated to 7 percent during 2001–2010, but slowed to 3.9 percent between 2011 and 2016. TFP growth, rather than growth in agricultural inputs, has been the most important factor driving growth in agricultural output since 2000. In fact, Cambodia's TFP growth has been much higher than in most other Southeast Asian countries. The market-oriented agriculture and trade policy reforms that the government passed have been conducive to private-sector investment and have prompted important production efficiencies. Moreover, trade integration with the global economy, and with ASEAN countries in particular, has been a major driver of past productivity growth. Diminishing TFP growth in recent years is a reason for concern, however, especially in the context of falling global agricultural commodity prices. Without increasing TFP, lower farm prices will reduce farm profits and rural incomes, and slow the reduction of poverty. Future acceleration of agricultural growth will be highly dependent on technical change.

Long-term growth in agricultural input, output, and productivity, 1980–2016



Source: Calculated by authors based on [USDA-ERS](#) (2019).

THE IMPACT OF HIGHER AND SMARTER RESEARCH INVESTMENTS ON PRODUCTIVITY

► Conventional recommendations of agricultural research intensity levels, such as the 1 percent target set by the United Nations, assume that national investments should be proportional to the size of the agricultural sector. In reality, a country's capacity to invest in agricultural research depends on a range of variables, including the size of the economy, a country's income level, its level of diversification of agricultural production, and the availability of relevant technology spillovers from other countries. In efforts to address these nuances, ASTI developed a multifactor indicator of research intensity that comprises a range of weighted criteria (for further details, see [Nin-Pratt 2016](#)). Under this approach, countries with similar characteristics (income, size of the economy, and size of the agricultural sector) are deemed to require similar minimum levels of research investment, and investment below that level is interpreted as an indication of potential underinvestment compared with similar countries.

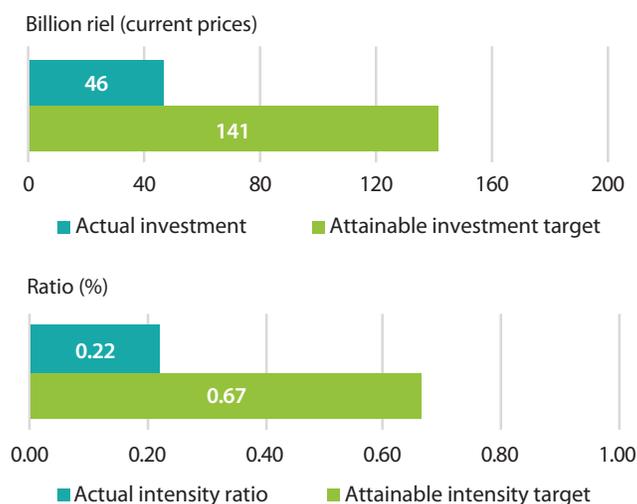
ASTI's indicator of research intensity shows that, despite accelerated investment in recent years, Cambodia is grossly underinvesting in agricultural research. Based on the structural characteristics of its economy and agricultural sector, the country should be able to invest 0.67 percent of its AgGDP in agricultural research (that is, three times as much as the 0.22 intensity ratio recorded in 2017). In other words, to have reached this target, Cambodia would need to have spent 141 billion riel in 2017, instead of the 46 billion riel it actually spent (both in current prices).

What would it take for Cambodia to close the investment gap by 2030, and how would higher agricultural R&D investment affect future productivity growth? In an effort to answer these questions, ASTI ran long-term projections on the impact of historical agricultural research investment on the country's agricultural output and productivity, and on the investments that would be required to reach future targets. Results indicate that to reach the 0.67 percent investment target by 2030, Cambodia would need to increase research investment by 8.4 percent per year from 2017 to 2030 (a rate very similar to the 8.0 percent yearly average R&D investment growth recorded during 2000–2017). In other words, if Cambodia continues to increase its yearly investment as it has since 2000, it will succeed in closing its R&D investment gap by 2030.

ASTI ran long-term projections on the impact on productivity of two future R&D investment scenarios. The first, a "business-as-usual" scenario, assumes that investment continues to grow from 2017 at an yearly rate of 8.0 percent (as mentioned, the actual average rate of R&D investment growth during 2000–2017), and that the allocation of R&D resources across crop and livestock areas remains the same as it was in 2017. The second scenario is based on the same yearly rate of investment growth (8.0 percent), but optimizes R&D resource allocation in favor of economically important crops and livestock species (forestry and fisheries were not part of this exercise).

Results show that (1) by increasing rice's share of investment in total crop and livestock research from 31 to 36 percent; (2) by doubling the relative shares of sugarcane, oil crops, chicken, pigs, maize, cassava, and sweet potatoes; and (3) by proportionally reducing research efforts in all other commodities, Cambodia would be able to achieve faster TFP growth. Under the business-as-usual scenario, TFP is projected to grow by 108 percent between 2016 and 2050, whereas under the optimized R&D resource allocation scenario, TFP is projected to grow by 140 percent during this period. In conclusion, Cambodia will need to sustain a high growth rate of R&D investment in the next two decades, prioritizing activities that could accelerate TFP growth. Even though R&D investment will not suffice to sustain high output growth, it would appear to be a necessary condition for diversifying agricultural production and making the agricultural sector more profitable and competitive on global markets.

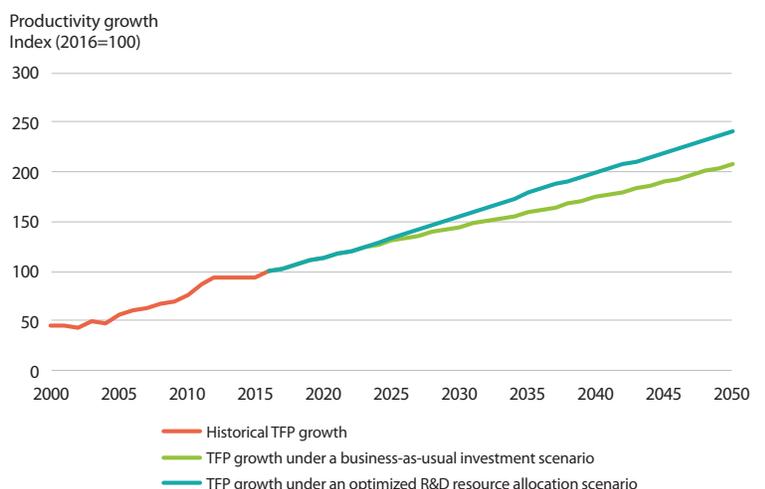
Actual research spending and attainable targets, 2017



Sources: Calculated by authors based on [ASTI \(2020\)](#) and [Nin-Pratt \(2016\)](#)

Notes: Traditionally, agricultural research intensity ratios compare investment and AgGDP levels to determine whether countries may be underinvesting. ASTI's Intensity Index incorporates additional factors that account for the size and nature of a nation's economy and hence facilitate more accurate cross-country comparisons. For more information, see <https://astinews.ifpri.info/2017/07/01/a-new-look-at-research-investment-goals-for-ssa/>.

Productivity projections under different investment scenarios, 2016–2050



Sources: Calculated by authors based on [ASTI \(2020\)](#), [USDA-ERS \(2018\)](#), [Nin-Pratt \(2016\)](#), [FAO \(2018\)](#), and [World Bank \(2018\)](#).

Notes: Resource allocation across crops and livestock under the "business-as-usual" scenario is the same as the actual 2017 allocation. Activities with a higher TFP response to R&D (rice, maize, roots and tubers, oil crops, sugarcane, chicken, and pigs) are prioritized under the "optimized R&D resource allocation" scenario. Total yearly growth in agricultural R&D investment is 8.0 percent per year under both scenarios. For more information on the methodology behind these projections, see <https://www.asti.cgiar.org/knowledge-stocks> and <https://www.asti.cgiar.org/ftp-projections>.

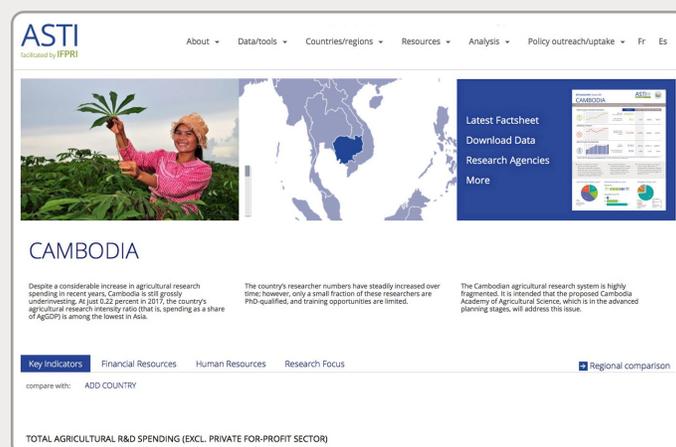
OVERVIEW OF CAMBODIA'S AGRICULTURAL RESEARCH AGENCIES

Sixteen agencies conduct agricultural research in Cambodia. CARDI (71 FTE researchers in 2017) is the country's main agricultural research institute focused on crops (mostly rice, cassava, maize, beans, and horticultural crops). It is headquartered just outside Phnom Penh and operates research stations across the country's various agroecological zones. Although GDA (76 FTEs) is not a research agency per se, it is an important contributor to Cambodia's agricultural research system in terms of performing technical, regulatory, and coordination functions related to food safety and food security on behalf of the Ministry of Agriculture, Forestry, and Fisheries and working closely with the provincial departments of agriculture, forestry and fisheries on applied research and extension. Four other government agencies conduct agricultural research. NAHPRI (20 FTEs) is Cambodia's main livestock research institute, IFReDI (23 FTEs) focuses on fisheries research, CRRI (24 FTEs) on rubber research, and FWRI (24 FTEs) on forestry research. Plans to merge these four agencies and CARDI into a single organization are in advanced stages. Cambodia's higher education sector plays a relatively limited role in the conduct of agricultural research. In total, the higher education agencies accounted for just 19 percent of the country's agricultural research capacity in 2017. RUA (48 FTEs spread across various faculties and departments) is the most significant higher education agency. It has a broad research focus covering crops, livestock, forestry, fisheries, socioeconomics, and food science. The scope and depth of the research activities of the remaining four higher education agencies is much more restricted. The Cambodia Development Resource Institute (6 FTEs) is the country's only nonprofit agency performing agricultural research. It is engaged in limited rice, vegetable, and socioeconomic research. No private companies were identified as conducting agricultural research in Cambodia.



For a complete list of the agencies included in ASTI's dataset for Cambodia, visit www.asti.cgiar.org/cambodia.

For more information on ASTI's data procedures and methodology, visit www.asti.cgiar.org/methodology; for more information on agricultural R&D in Cambodia, visit www.asti.cgiar.org/cambodia.



ACRONYM LIST

ACIAR	Australian Centre for International Agricultural Research
AgGDP	agricultural gross domestic product
ASEAN	Association of Southeast Asian Nations
ASDP	Agriculture Strategic Development Plan
CARDI	Cambodian Agricultural Research and Development Institute
CRRI	Cambodian Rubber Research Institute
FTE(s)	full-time equivalent(s)
FWRI	Institute of Forest and Wildlife Research
GDA	General Directorate of Agriculture
IFReDI	Inland Fisheries Research and Development Institute
NAHPRI	National Animal Health and Production Research Institute
PPP(s)	purchasing power parity (exchange rates)
R&D	research and experimental development
RUA	Royal University of Agriculture
TFP	total factor productivity

ABOUT ASTI, IFPRI, APAARI, AND CARDI

Working through collaborative alliances with numerous national and regional R&D agencies and international institutions, **ASTI** is a comprehensive and trusted source of information on agricultural R&D systems across the developing world. In the Indo-Pacific region, ASTI is facilitated by the **International Food Policy Research Institute (IFPRI)** and the **Asia-Pacific Association of Agricultural Research Institutions (APAARI)**. The **Cambodian Agricultural Research and Development Institute (CARDI)** under the Ministry of Agriculture, Forestry, and Fisheries is the country's principal crop research institute.

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