



# Philippines: Why Increase in Research and Development (R&D) for Agriculture and Fisheries is Needed?

## Sustainable Agricultural Landscapes in Southeast Asia

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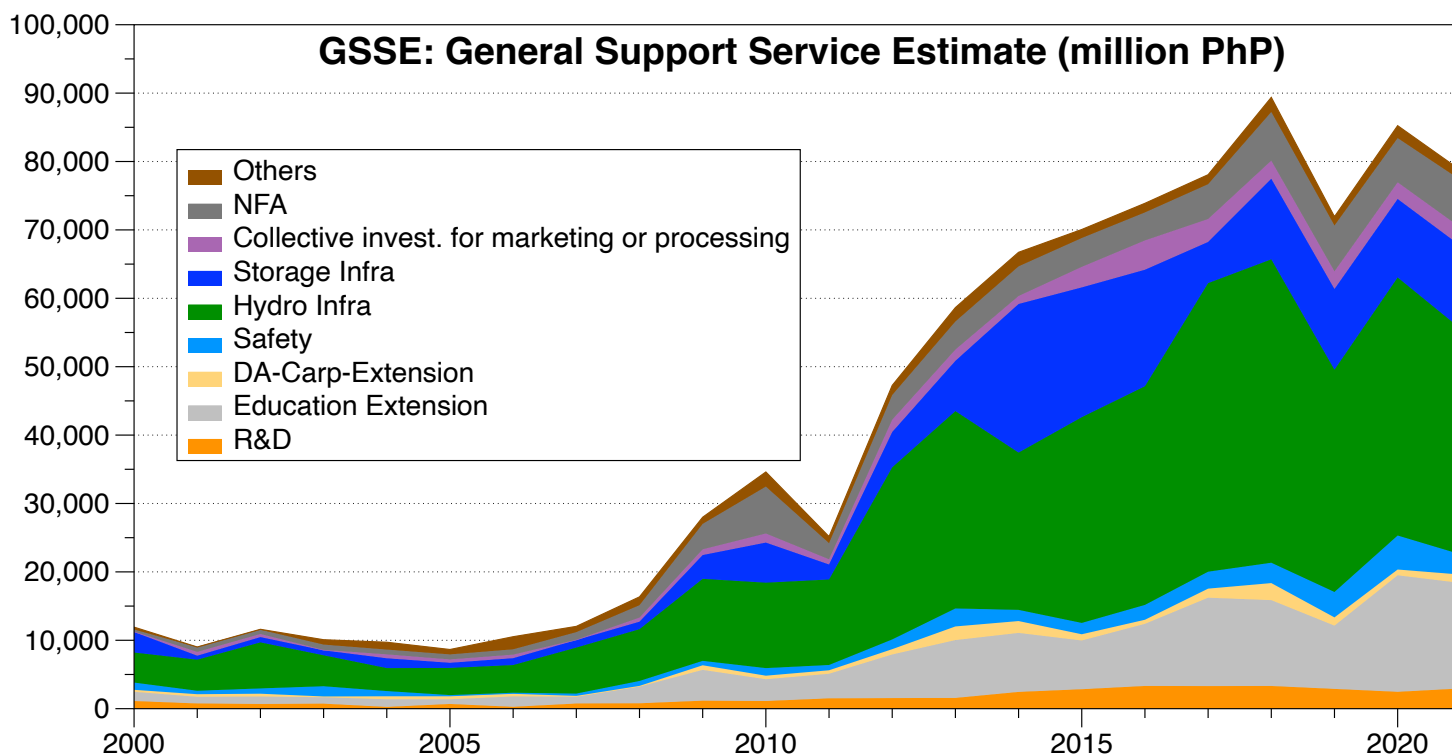
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**The Philippine agriculture and fisheries sectors are crucial for the nation's growth, but very low R&D investment hinders their potential. Increasing this investment is essential to make these sectors climate-resilient and competitive. Currently, Department of Agriculture (DA) spending on R&D is only 0.15% of the agricultural GDP (AgGDP), far below the necessary level (Source DA). This ratio should be, at least, around 1%. Addressing food security challenges, climate change impacts, and smallholders' economic vulnerabilities requires a significant and systematic expansion in R&D funding.**

### Importance of Agriculture and Fisheries

***With or without climate change issue, the budget for R&D on agriculture and fisheries sectors in the Philippines has long been overdue for an increase to stop stagnant growth, escalating commercial balance deficit, and rural poverty.***

President Ferdinand Romualdez Marcos Jr. emphasised the critical role of agriculture in his inaugural message, noting the sector's need for urgent attention. Despite its importance, agriculture's contribution to GDP has declined from 23% in 1982 to 9.4% in 2023 (in current price - PSA, 2024). The trade deficit in agriculture widened from -\$1.47 billion in 2012 to -\$9.9 billion in 2022 (Chatham House), highlighting the sector's growing vulnerability to international market fluctuations and climate change.



**Figure 1:** Breakdown of General Support Service Estimate (GSSE) for The Philippine agriculture and fisheries sector at current prices. At the bottom, in orange, is the R&D budget; above it, in gray and yellow, are the extension budgets. The budget available for research is extremely low compared to total government spending on agriculture and fisheries, at around 3.5%. Source of data: OECD (2022).

### Current R&D Investment

***The R&D budget in the agriculture and fisheries sector in the Philippines is below international standards. Significant yet achievable increases in R&D funds are needed to make the sector competitive, innovative, impactful and resilient to climate change effects.***

The government allocates to AF R&D a modest percentage (approximately 3.5%) of its budget devoted to support the agriculture and fisheries sector (Sources: OECD, see Fig. 1). This equates to 6% in Vietnam, 10% in Brazil, 11% in China, and 21% among OECD countries (OECD, 2022), where R&D investment in agriculture is substantially higher.

Another ratio is the R&D intensity, which represents public investment in AF R&D as a percentage of AgGDP. This ratio in the Philippines (0.20%) is significantly lower than in other countries, including Malaysia (1–2%), Brazil (2%), and OECD countries (3–4%) (see Table 1). A regional study indicates that the attainable agricultural research intensity ratio in the Philippines could be 1.72% (ASTI and Nin Pratt in Stads G.J. & al. 2020).

### Benefits of Increased R&D Investment

***The R&D investment in the agriculture and fisheries sectors in the Philippines pays off and promises huge potential for economy-wide impacts should systemic changes be achieved, with increased budget playing a crucial role in unlocking this potential.***

Investing in agricultural R&D has shown substantial returns (OECD 2022; Alston 2021; Piesse & Thirtle 2010). For instance, public effort in agricultural R&D leads to significant yield increases and rural poverty reduction. Studies indicate that R&D investments can produce a cost-benefit ratio of 1:10, making it one of the best investments for government support (Alston, 2021). In the Philippines, the rate of return on R&D investments is around 60%, higher than other investments (Cororaton, 1999). Specific research on rice varietal development shows positive economic returns, although the rate of returns is declining faster in the Philippines than in other countries like Bangladesh (Dikitanan et al., 2022).

### Challenges and Recommendations

***Sufficient, sustained and regular R&D budget must be strategically allocated by aligning it with the existing national agriculture and fisheries modernisation and industrialisation plans and roadmaps (NAFMIP, AFMA, etc) along with the National Harmonised R&D Agenda.***

GDP Current price (million PhP)	2018	2019	2020	2021	2022	2023
1 - Gross Domestic Product (GDP)*	18 265 190	19 517 863	17 951 574	19 410 568	22 028 276	24 318 301
2 - Agro GDP	1 762 616	1 721 539	1 828 424	1 954 345	2 104 090	2 285 159
3 - DA R&D **	3 162	2 628	2 619	2 754	2 571	2 835
4 - AF R&DE Budget Dost-PCAARRD***	1 196	1 096	1 121	1 333	1 285	
5 - Total R&D of DA and PCAARRD	4 358	3 724	3 740	4 087	3 856	
6 - DA R&D intensity: (3/2)	0,18%	0,15%	0,14%	0,14%	0,12%	0,12%
7 - Public R&D intensity (6/2)	0,25%	0,22%	0,20%	0,21%	0,18%	

**Table 1:** DA and Public R&D intensity are far below current standards which should be at least around 1-2 % ; \* GDP Agriculture Forestry and Fishing at current price in million PhP (Sources: PSA); \*\* DA R&D in million PhP, source DA; \*\*\*Source DOST)

### 1. Budget Allocation and Management:

The current allocation for R&D is insufficient and not strategically aligned with the national modernisation plans. The NAFMIP (National Agriculture and Fisheries Modernisation and Industrial Plan) has indicated that there is a need for increased effort in R&D to transform the sector (NAFMIP, 2022). To achieve this, the investment in R&D should reach at least the 1% intensity ratio, with a further 1% needed for extension. Currently, we are not at that point.

Efficient use of funds requires shifting from market price backing to expenditure support and recognising R&D as a public good deserving government spending (Briones, 2022). It is also crucial to allocate a larger budget for research in sectors that can significantly enhance the income of small farmers, thereby stabilizing the trade balance while addressing climate change issues. These sectors include fruit and vegetable, fisheries, agroforestry, climate-smart agriculture and aquaculture.

### 2. Fragmentation and Coordination:

**While the R&D budget for the agriculture and fishery sector will require substantial increases, this may be achieved through innovations that harness resources available in the current institutional and administrative set-up.**

The R&D structure in the Philippines is fragmented, necessitating better harmonisation and rationalisation of policies and programs across institutions. Continued and expanded coordination between DOST-PCAARRD and DA-BAR is crucial (DA-BAR, 2023; DOST 2022). To realise this, the following considerations are highlighted:

- The increase in the R&D budget of the A&F sector may be with a reorganisation of the R&D agencies and reforms in accounting, auditing procedures and procurement system to grow their absorptive capacity. Consequently these fundings could be used more effectively and efficiently. Simultaneously, measures should be taken to attract talented young researchers.
- The budget increase can be implemented gradually, aligning with the Philippine National Development Plans. A phased approach, directed towards the required R&D financing expansion over specified periods, would make the target more achievable.
- Addressing the fragmentation of A&F R&D in the Philippines demands ongoing efforts to harmonise and rationalise relevant policies, plans, programs and activities among all concerned agencies. This includes better understanding of the budgets allocations, enhanced distribution strategies to avoid duplication, and establishment of more platforms for sharing, learning and complementing R&D results. Coordination initiatives between DOST-PCAARRD and DA-BAR should be continued, deepened, and expanded. International cooperation, particularly with ASTI, is vital for monitoring the Philippines's efforts in agricultural and food research and development (R&D) and for benchmarking its performance against global standards. Such collaboration is crucial for informed decision-making during budgetary planning.
- The Philippines devotes a considerable and growing financial dedication in supporting its agriculture and fisheries sector, and rightly so, as it is a strategic and essential sector that is regularly exposed to multiple crises. A strategic budget reallocation could reconcile short-term and long-term interests, especially by significantly growing the share of AF R&D, which currently amounts to about 3 to \$4 per \$100 spent on encouraging the sector. Also, by guaranteeing that the share of R&D in A&F increases progressively to \$4 then to \$5 for every \$100 spent, today's decision makers could ensure that the objectives of national plans for food security, climate change adaptation, and rural poverty reduction can be met. This approach also facilitates future stabilisation of budgets supporting agriculture and fisheries.

## Climate solutions are increasing but would require more R&D investment to make it bigger, smarter, more impactful

The Philippines is one of the most exposed countries on the planet. It is ranked 4th of the Long-Term Climate Risk Index (CRI). FAO (2022) noted that most of the territory particularly about 70% of its population face climate risks. The economic impact on the agriculture and fisheries sector is considerable. Weather shocks affect agriculture by damaging infrastructures, crops and livestock. Climate risks such as floods, droughts, severe tropical cyclones, landslides, forest fires and disease outbreaks on crops, aquaculture and livestock affect especially, small farmers.

As among a major response could be Climate-Smart Agriculture (CSA) that for years has gained national interest. The CSA makes the link between climate change and food security. This approach has already been adopted in several countries. Three principles structure the CSA : adaptation to climate change, mitigation of climate change, and food security. Technically, the CSA is based on ecological intensification, which consists of strengthening existing ecological mechanisms for farmers, while ensuring the agricultural production that the country needs could be met. These approaches require to be locally specific, multidisciplinary and would require substantial R&D efforts.

The presence of climate change has added extra layer to making the agriculture and fishery sector of the Philippines competitive and resilient. Sombilla (2018) noted the importance of better climate change-related R&D particularly in the agriculture and fishery sectors in the Philippines. Of interest are science-based knowledge on climate change adaptation and mitigation methods, best practices, and technologies that must be all aimed towards increasing productivity while enhancing lowland and upland ecosystems through land, soil and water conservation and mitigation (Sombilla 2018). Systematic, comprehensive and across the value-chain R&D, extension and innovation system is needed to bolster breeding and improved farm and creative practices, information and public awareness campaigns. And the adoption of effective regulatory measures and policies to correct human-and industry-induced malpractice would be critical.

### Concluding Remarks

The perennial underinvestment in R&D hinders the country's general goal of making the agriculture and fishery sector modernised, competitive, and robust. The sector's stagnant growth balanced deficit and its low contribution to poverty reduction have long required the incentive of enough R&D budget, made more urgent by the challenges posed by climate change.

A significant yet achievable increase in R&D budget is needed to make the sector competitive, innovative, impactful and resilient to climate change impacts. Such increases shall be concomitant to the upliftment of the competence of research professionals and the corresponding institutions/agencies. Additionally, the continuum between research and extension/training can be better achieved (Bantayan et al., 2023). Corrective measures must be in place to enable the Philippines allocate increases in DA R&D budget from the current ~0.15% total public expenditure for R&D as a percentage of national production of the Agriculture and Fisheries sector (AgGDP). The goal of achieving a modernised agriculture and fisheries sector would require the government to allot at least \$5 for R&D for every \$100 it spends to support the agriculture and fisheries sector. Sufficient, sustained and regular R&D budget must be strategically apportioned by aligning it with the existing national agriculture and fisheries modernisation and industrialisation plans and roadmaps (NAFMIP, AFMA, etc) along with the National Harmonised R&D Agenda. In the immediate term, the country's R&D needs for its agriculture and fishery sector could be the base of a gradual increase the size of the R&D budget for the agriculture and fishery sectors, primarily through the Department of Agriculture.

The R&D investment in the agriculture and fisheries sectors in the Philippines pays off and promises huge potential for economy-wide impacts should systemic changes be achieved, with increased funding playing a crucial role in unlocking this potential. While the R&D budget for the agriculture and fishery sector may require substantial rises, this may be accomplished through innovations that harness resources available in the current institutional and administrative set-up. Climate solutions are increasing but would require more R&D effort to make it bigger, smarter, more impactful.

