Chapter 3
The Central Luzon Loop Survey: Rice Farming in the Philippines from 1966 to 2021

Kei Kajisa, Piedad Moya, and Fe Gascon

Abstract The Central Luzon Loop Survey in the Philippines is one of the longest-running and ongoing household-level farm surveys in tropical Asia. This chapter reviews the changes in rice farming from 1966 to 2021, with a particular focus on the past decade. The data show that rice yields have stagnated and become more variable despite a prompt and continuous switch to newer modern varieties with an appropriate nitrogen application level since the Green Revolution. This implies that the Green Revolution-type agricultural development is at a crossroads. As background factors, this chapter reviews how the adoption of labor-saving technologies, mechanization, and farm size have changed over time under increasing rural labor scarcity. A subjective assessment of the impact of COVID-19 on rice farming is also discussed.

3.1 Introduction

The Central Luzon Loop Survey in the Philippines (the Loop Survey) is one of the longest-running and still ongoing household-level farm surveys in tropical Asia.[1] The International Rice Research Institute (IRRI) started the survey on the eve of

[1] Other distinguished long-term farm household surveys covering multiple villages include the Village Dynamics in South Asia (VDSA) by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), and the Bangladesh Panel initiated by IRRI and succeeded by the Bangladesh Institute of Development Studies (BIDS) and BRAC. Single village, fixed-point long-term surveys include the East Laguna village survey in the Philippines (Hayami and Kikuchi 2000) and Palanpur in India (Bliss and Stern 1982; Lanjow and Stern 1998; Himanshu et al. 2018).

K. Kajisa (✉)
Aoyama Gakuin University, Tokyo, Japan
e-mail: kei.kajisa@gmail.com

P. Moya
International Rice Research Institute (IRRI), Los Baños, Philippines

F. Gascon
Former IRRI Researcher, Los Baños, Philippines

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the Green Revolution in 1966, the year of the official release of the miracle rice, IR8. Since then, the survey has been conducted every four to five years until 2021, generating 14 rounds of datasets, covering a period of more than half a century.[2] The datasets of this feature enable us to explore the situation of rice farming and rice farm families before the Green Revolution, how the situation changed through the progress of the Green Revolution, and the emerging issues in the post-Green Revolution era in the Philippines.

The Loop Survey revealed Green Revolution's substantial impact on the country's food production and poverty alleviation. Among the 34 major publications (books, reports, and journal articles) produced from the Loop Survey, comprehensive documentation from 1966 (first round) to 2012 (12th round) was found in a study by Moya et al. (2015).[3] It shows that the paddy (unmilled rice) yield per hectare had increased from 2.3 tons per hectare (t/ha) in 1966 to 3.9 t/ha in 2011 in the wet (rainy) season and from 1.8 t/ha in 1967 to 5.8 t/ha in 2012 in the dry season, thereby increasing the farmers' rice income. Accordingly, the first-generation Green Revolution farmers increased schooling investment in their children, resulting in an increase in the proportion of secondary- or tertiary-level graduates from 18 to 65% in the same period. These educated children moved to the non-agricultural sector. Hence, although the proportion of rice income increased from 68% in the 1960s to 86% in the 1970s, it decreased successively since then to the level of 17% in the first decade of the twenty-first century ('00s), whereas the proportion of off-farm income and remittances accounted for 34% and 28%, respectively. In general, countries benefiting from the Green Revolution show a similar pattern of agricultural development and income change (Otsuka et al. 2008).

However, Green Revolution-style agricultural development is now at a crossroads. It is ironic that the Green Revolution, which has achieved success through the advancement of seed-fertilizer technology and the adoption of labor-intensive crop care, is now challenged by increasing rural labor scarcity caused by its success. This is an inevitable historical pattern of agricultural transformation in the Philippines and other countries that have started economic 'take-offs' (Viswanathan et al. 2012; Briones and Felipe 2013; Timmer 1988). Furthermore, disasters and infectious disease pandemics are becoming increasingly rampant as contemporary phenomena. The achievement of sustainable rice farming is challenged by these contemporary issues.

This chapter aims to identify emerging issues on rice farming in the post-Green Revolution era in the Philippines using the last two rounds of the Loop Survey, namely the 2015–16 and 2020–21 rounds. This discussion includes the impact of the COVID-19 pandemic on rice farming.

[2] See Appendix Table 3.4 for the researchers involved in each round. Keijiro Otsuka led the 6th round (1986–87).

[3] See Appendix B of Moya et al. (2015) for the 33 publications (other than Moya et al. 2015) released by 2009.

3.2 Survey Design and Survey Site

The use of 'loop' in the name stems from the survey's sampling feature: selecting sample farm fields along the loop of the national highway passing through six provinces (Fig. 3.1). Randomization of the sample was achieved by specifying the fields to be observed at specific kilometer posts along the main highway (e.g., the 50th, 60th, 70th, etc.). The most important feature of the data is that they were collected from the same fields despite changing operators. Hence, this dataset provides long-term, plot-level panel data. The initial sample size was 95 farmers who cultivated 120 parcels in 1966, gradually decreasing mainly due to land conversion to non-agricultural purposes, thus supplemented in the 1979–80 round, for a total of 148 farmers with 338 parcels. Since then, no compensation has been made, resulting in a sample size of 81, with 126 parcels in the 2021 interview. The sample size for each round is presented in Table 3.1.

The area is known as the country's rice bowl and has a distinct wet season (WS) and dry season (DS)—the WS begins in May or June and ends in October, and the DS begins in November and ends in March or April. The introduction of large-scale surface irrigation systems in the 1970s and the adoption of low-lift pumps and shallow

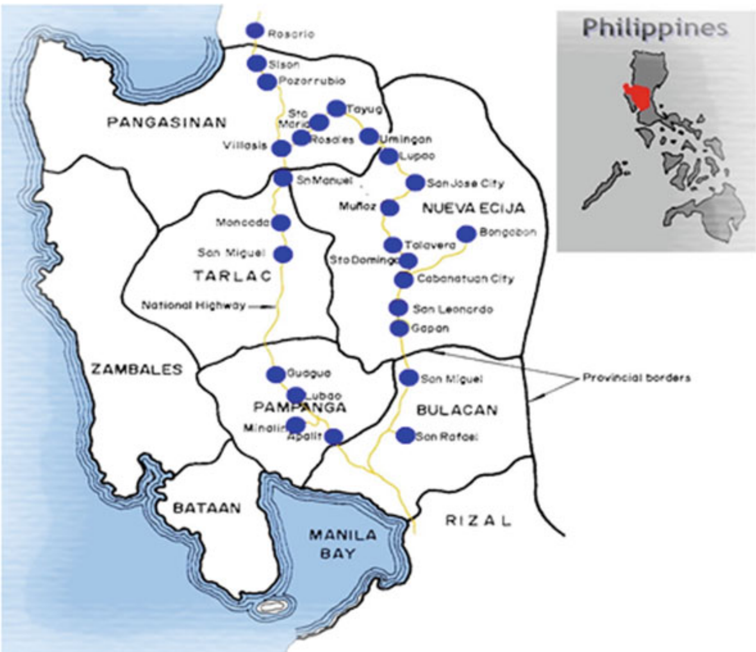

Fig. 3.1 Map of the Central Luzon Loop Survey

Table 3.1 Adoption (%) of new technologies, farm size, and area planted with rice (ha), 1966–2021 (The Loop Survey)

Wet season (WS)	1966	1970	1974	1979	1982	1986	1990	1994	1999	2003	2008	2011	2015	2020
Animal	96	90	98	72	67	90	89	75	74	56	59	52	63	39
Power tiller (2 W)			17	47	56	58	85	93	96	99	99	100	99	94
Big tractor (4 W)	11	42	36	30	24	14	18	16	28	26	31	30	31	35
Rotavator							2		2			4	16	52
Manual threshing	13	26	51	46	10	4								1
Small thresher	0	0	5	21	73	96	100	100	100	100	100	100	55	3
Big thresher	87	74	44	31	17									3
Combine harvester												0	45	96
Direct seeding				1	16	15	22	24	21	14	7	8	10	27
Transplanting	100	100	100	100	90	95	85	81	80	87	94	92	90	76

(continued)

Table 3.1 (continued)

Dry season (DS)	1967	1971	1975	1980		1987	1991	1995	1998	2004	2007	2012	2016	2021
Animal	100	100	79	53		69	98	77	67	58	65	65	78	40
Power tiller (2 W)	6	0	43	79		88	90	100	93	100	100	100	100	92
Big tractor (4 W)	47	62	43	9		6	2	9	17	17	18	8	28	42
Rotavator												15	2	49
Manual threshing	24	31		37		3								4
Small thresher			36	44		98	100	100	100	100	100	100	54	8
Big thresher	71	69	64	20										
Combine harvester												0	46	96
Direct seeding				9		48	71	63	54	63	57	30	43	45
Transplanting	100	100	100	91		59	33	41	48	41	44	73	57	61

(continued)

Table 3.1 (continued)

Years	1966–67	1970–71	1974–75	1979–80	1982	1986–87	1990–91	1994–95	1999–2000	2003–04	2008–09	2011–12	2015–16	2020–21
Farm size (annual) (ha)*	2.09	2.54	2.60	1.89	1.78	1.81	1.81	1.7	1.59	1.9	1.75	1.94	2.2	1.79
Area planted with rice in WS (ha)	1.91	2.12	1.86	1.23	1.05	1.40	1.12	1.21	1.17	1.22	1.16	1.22	1.20	1.18
Area planted with rice in DS (ha)	1.49	1.88	1.53	1.38		1.32	1.23	1.18	1.12	1.33	1.21	1.32	1.46	1.37
Sample size	95	62	59	148	135	120	108	100	85	116	107	95	85	81
Number of parcels	120	89	99	338	226	232	254	212	172	263	172	209	129	126
Number of farmers planting in WS	95	62	59	147	135	114	107	99	82	115	101	93	85	77
Number of farmers planting in DS	17	13	14	81	na	64	58	56	46	71	68	66	50	71

Note * Defined as operational landholdings including rented-in and excluding rented-out parcels tube wells in the 1990s have made DS rice farming possible.[4] Accordingly, the crop intensity (taking a value of 2 if fully double-cropped), which was 1.33 in 1966–67, jumped up to 1.55 in 1979–80 due to the availability of surface irrigation systems, and then further increased to 1.82 by 2011–12, mainly due to the expansion of pump irrigation.

The last feature of the survey site is land ownership and tenure distribution. Large rice and sugarcane *haciendas* (plantations) developed in this area during the Spanish colonial period in the nineteenth century. Given this historical background, the Central Luzon region was targeted as the first place for implementing the comprehensive land reform program.[5] From 1966 to 2012, the distribution of tenancy changed from 13 to 47% as owners, 13–29% as leaseholders, 75–5% as share tenants, and 0–19% as borrowers, indicating an increase in owner or leaseholder cultivators who used to be the share tenants. Usually, in other countries, land reforms are implemented at once in a short period, but it is unique in the Philippines that the program has been continuously extended, and the reform is continuing (as of 2021).

The last survey round was conducted under the COVID-19 pandemic using telephone interviews one year after the regular cycle. Hence, it covers the regular period of 2019–20 with recall data and the period of 2020–21. In the telephone interviews, questions were limited to key variables, but they also included questions about the impact of the COVID-19 pandemic. This chapter used only 2020–21 data as the data patterns in 2019–20 are quite similar.

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[4] The completion of the Pantabangan Dam in 1975 and the establishment of the Upper Pampanga Integrated Irrigation System represented the first major irrigation project in the region. The Casecnan Irrigation and Hydroelectric Plant, which commenced in 2002, diverts water from the Casecnan and Taan rivers of Nueva Vizcaya to the Pantabangan Reservoir, further enhancing the expansion of the irrigated area in the region. In the last two decades, the adoption of low-lift pumps and shallow tube wells has been the major source of irrigation expansion, particularly in the dry season.

[5] The Agricultural Land Reform Code (RA 3844), was a major advancement of land reform in the Philippines. It was enacted in 1963 to abolish tenancy and establish a leasehold system in which farmers paid fixed rentals to landlords, rather than a percentage of the harvest. In September 1972, the second presidential decree that Marcos issued under martial law declared the entire Philippines a land reform area. A month later, he issued Presidential Decree No. 27, which had the specifics of his land reform program. The reform attempted to convert share tenants to leaseholders when the landlord owned less than 7 hectares (ha) of land or to amortizing owners when the landlord owned more than 7 ha of land. The reform procedure involved two steps. The first, Operation Leasehold, converted share tenancy to leasehold tenancy with rent fixed at a rate of 25% of the average harvest for the three normal years preceding the operation. The second step, Operation Land Transfer, transferred land ownership to tenants. In the latter operation, the government expropriated the area in excess of the landlord retention limit, with compensation to the landlord being 10% of the land value in cash and the rest in interest-free redeemable Land Bank bonds. The land was resold to the tenants for annual mortgage payments over 25 years, and they were granted a Certificate of Land Transfer (CLT). Upon completion of the mortgage payments, the CLT holders were given Emancipation Patents (EP) on the land, that is, a land ownership title with the restricted right of land sale. In 1988, the Comprehensive Agrarian Reform Program (CARP), which covers non-rice and non-corn areas, was introduced and has been continuously extended (as of 2021). See Moya et al. (2015) for more details.

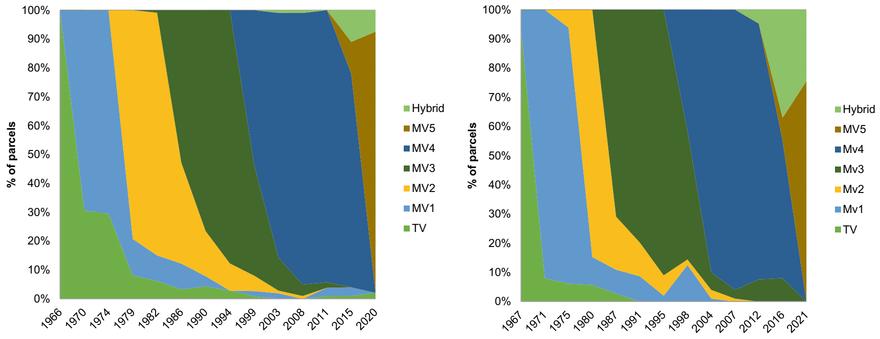

Fig. 3.2 Trends in the adoption of modern varieties in the Wet season (left) and the Dry season (right), 1966–2021 (The Loop Survey)

3.3 Recent Changes

The Asian rice Green Revolution has been led by farmers' vigorous adoption of seed-fertilizer technology under irrigated or favorable rainfed conditions. Figure 3.2 shows the seasonal diffusion of modern varieties (MVs) from 1966 to 2021. Following the analytical style of Estudillo and Otsuka (2001, 2006) and Laborte et al. (2015), the varieties are classified by generation based on their release dates and distinct characteristics, consisting of the traditional variety, the five modern variety generations (MV1 to MV5), and hybrid rice.[6] The figure indicates that the switch from old to new MVs has occurred promptly; more than 70–80% were replaced within four-year intervals. This implies that Loop farmers are active farm managers with strong enthusiasm for newer technologies. Recently, hybrid rice varieties have become popular, particularly in the DS when the risks of pests, diseases, and harsh weather shocks are low under irrigated conditions (Laborte et al. 2015). The hybrid varieties have a potential yield of approximately 10–14 t/ha compared with 6–10 t/ha of the latest inbred varieties. This has proceeded since 2011, and 7% of farmers in the 2020 WS and 24% in the 2021 DS cultivated the hybrid varieties.

In parallel with MV diffusion, farmers increased the application of inorganic fertilizers. The Loop data indicate that the amount of nitrogen applied to rice fields started at 9 kg per hectare (kg/ha) in 1966 (pre-Green Revolution), increased steadily since then, and in the 1987 DS and the 1994 WS reached close to the recommended 100

[6] The MV1 is the first generation of modern varieties released from the mid-1960s to the mid-1970s, including IR8, sharing the trait of being high-yielding without pest and disease resistance. MV2 varieties released from the mid-1970s to the mid-1980s, were characterized as having short maturity with multiple pest and disease resistance traits. MV3 varieties released from the mid-1980s to the mid-1990s, added better grain quality, and a stronger host plant resistance trait, and MV4 (from the mid-1990s to 2005) added tolerance to abiotic stresses and lower amylose content (for soft-cooked rice) but had lower resistance to pests and diseases. MV5 varieties were released after 2005 without taking into account the difference in characteristics with MV4.

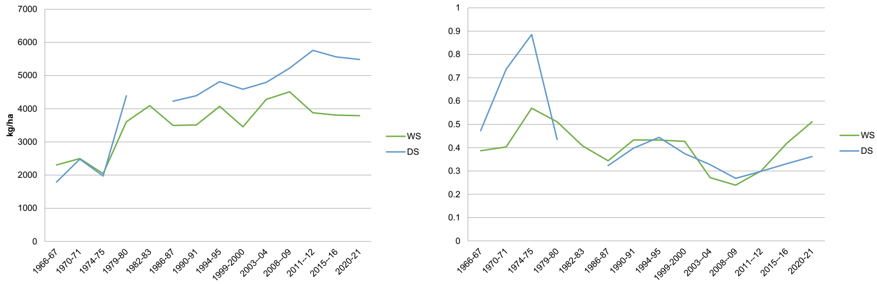

Fig. 3.3 Trends in the mean (left) and the coefficient of variation (right) of paddy yield, 1966–2021

kg/ha level (Moya et al. 2015). The nitrogen application level has been approximately 100 kg/ha since then.

What is the impact of the diffusion of seed-fertilizer technology on rice productivity? Figure 3.3 shows the long-term trend of the mean (Panel A) and coefficient of variation (CV) (Panel B) of the paddy yield (kg/ha). The yield increased sharply during the early phase of the Green Revolution (the 1970s and the 1980s). During this period, the CV increased initially in the 1970s but steadily declined until the early '00s, indicating that the Green Revolution technologies were much riskier than the traditional ones when they were introduced, but gradually standardized.

We can identify two features in the recent rounds: (1) stagnant yield growth in the WS since the late 1990s and in the DS since the 2010s, and (2) the increasing trend of the CV since the 2010s. As we have seen, the adoption of hybrid rice varieties has continued since 2011. However, the yield did not significantly increase. The recent trend indicates that the potential yield has not been fully realized in the fields and that the stability of rice production has been diminished.

This trend may be attributed to two major reasons. First, many sources indicate that natural disaster events, such as floods and insect outbreaks, are increasing in the Philippines, but the varieties commonly planted in recent years (i.e., MV4 and MV5) are characterized by lower resistance to pests and diseases compared to MV2 and MV3 (Laborte et al. 2015). In addition, floods have become more rampant in Central Luzon because newly-constructed factories and roads block water flow to the drainage. In this regard, natural and human-made disasters have hindered yield increases in this region. Second, increasing labor shortages require a structural transformation in rice farming, but this has not been fully achieved. The second point is discussed later in this section.

How has the increasing labor shortage affected rice farming in this area? Table 3.1 shows the trend in the adoption of labor-saving technologies, farm size (operational landholdings including rented-in parcels and excluding rented-out parcels), and the area planted with rice from 1966 to 2021, revealing four features. First, small-scale mechanization proceeded rapidly after the Green Revolution and was completed in the early 1990s. The adoption rate of power tillers (hand tractors) and small threshers reached approximately 100% by the early 1990s.

Second, the adoption of combine harvesters has jumped up in the last two rounds—the government promoted it as a replacement for manual harvesting. Its utilization increased in both seasons from 0% in 2011–12 to 96% in 2020–21. This was the reason for the sharp decline in the use of small threshers to the level of 3% in the 2020 WS and 8% in the 2021 DS.

Third, crop establishment still fully relies on manual labor—it can be done either through transplanting or direct seeding, with the latter—broadcasting seeds directly on a field—being a labor-saving method introduced in this area in the 1980s. However, it is appropriate only for plots with suitable water control because otherwise, the germination of seeds cannot be synchronized. Hence, as shown in Table 3.1, the boom in direct seeding's adoption during the introduction period notwithstanding, particularly in the WS when water control is more difficult; the adoption rate in the WS decreased to merely 7% in 2008. However, the last round survey shows it increased again to 27% in 2020, presumably reflecting increasing challenges in finding a sufficient number of laborers for transplanting. Simultaneously, transplanting machines have not been used in the 2020–21 round. Thus, crop establishment is still a relatively labor-intensive activity, although not as much as in the past when direct seeding technology was unavailable.

Fourth, farm size (shown in the lower part of the table) shows no dramatic change at approximately 2 hectares (ha). Given this farm size, the area planted with rice in the WS declined from approximately 2 ha in the 1970s to approximately 1 ha in the 1980s. It then remained almost unchanged at slightly more than 1 ha. In contrast, the area in the DS was slightly less than 1.5 ha throughout the survey period. To better understand this aspect, we need to consider the land reform issues of this country. The land reform program has continued to be extended, and there is concern that landlords are reluctant to rent out their land for fear of land expropriation, resulting in an inactive land rental market. This could be a hurdle for land consolidation and further progress in large-scale mechanization.

In summary, mechanization is still limited to land preparation, harvesting, and threshing, and enlargement of the farm size has not been realized at the study site. In other words, the agricultural transformation has reached only the halfway mark.

As explained above, crop establishment depends fully on manual labor as of 2020–21. Nevertheless, the labor employment for this activity is also affected by the increasing rural labor shortage. Table 3.2 shows the number and composition of hired labor for crop establishment by labor type from 2012 to 2016 using the recall data collected in the 2015–16 round. We classify hired labor into three categories based on the length of the working period: (1) regular workers who have worked for the interviewee farmer for more than five years in total; (2) occasional workers who have worked for 1–4 years in total; and (3) new workers who worked for the first time.[7]

[7] In our survey module, we also asked questions about where the laborers came from (for example, the same village, different village but still in the same municipality, and different municipality). Since we find that the location and the length of work period are highly correlated so that the workers from the distant locations are relatively newer than the others, we use only the length of work period for our analysis.

Table 3.2 Composition of hired labor for crop establishment, 2012–2016 (The Loop Survey)

Wet season	**2012**	**2013**	**2014**	**2015**
No. of hired labor/ha	23	22	21	26
Hired labor composition (%)				
Regular (≥5 years)	62	61	53	35
Occasional (1–4 years)	21	14	21	37
New	17	25	27	28
Dry season	**2013**	**2014**	**2015**	**2016**
No. of hired labor/ha	23	18	19	19
Hired labor composition (%)				
Regular (≥5 years)	51	54	43	39
Occasional (1–4 years)	36	30	39	39
New	14	16	19	22

Note 2012 WS–2015 DS is based on recall data

The table clearly indicates that it had become more challenging to recruit regular workers, and the farmers had to rely more on new workers in both the WS and the DS. The proportion of regular workers decreased from 62 to 35%, whereas that of new workers increased from 17 to 28% in the WS. A similar trend was observed for the DS. The stagnant and fluctuating yield in recent rounds may stem from the management challenges of new unknown laborers who might not only be unfamiliar with the agronomic characteristics of hiring farmers' particular plots (thus cannot do transplanting efficiently) but also be less reluctant to commit opportunistic behaviors, such as the delay or absence in the appointment and labor effort shirking.[8]

Therefore, Table 3.2 implies that although labor was becoming scarce within the Loop villages, it was still available from distant areas at least until the 2015–16 round. As the Ricardian trap model predicted, the labor wage rate would not rise if this were the case. Figure 3.4 shows the agricultural wage rate trend from 1966 to 2021. It clearly shows that although the nominal wage rate continued to increase sharply, particularly after the 1980s, the real wage rate (deflated by consumer price index [CPI] or paddy price) initially increased from the 1980s until the mid-1990s but was relatively stable in the '00s until the 2015–16 round. However, the real wage rate seems to have started to rise in the 2020–21 round. A sharp increase in the real wage rate in the 1980s is puzzling because economic growth was slow, and population growth was high during that period.

Last, we provide an overview of the impact of the COVID-19 pandemic on rice farming. In our survey period, the 2000 WS and the 2021 DS were the pandemic periods of the country, with a much higher number of cases in the 2021 DS. Anecdotal

[8] When farmers need many laborers for transplanting and manual harvesting, they usually call for a foreman, called a *kabisiliya*, who has his or her group of laborers. Hence, the control of opportunistic behavior is an issue that has to be handled by the kabisiliya. Anecdotal evidence during the interview tells that farmers are becoming more serious about finding a reliable kabisiliya.

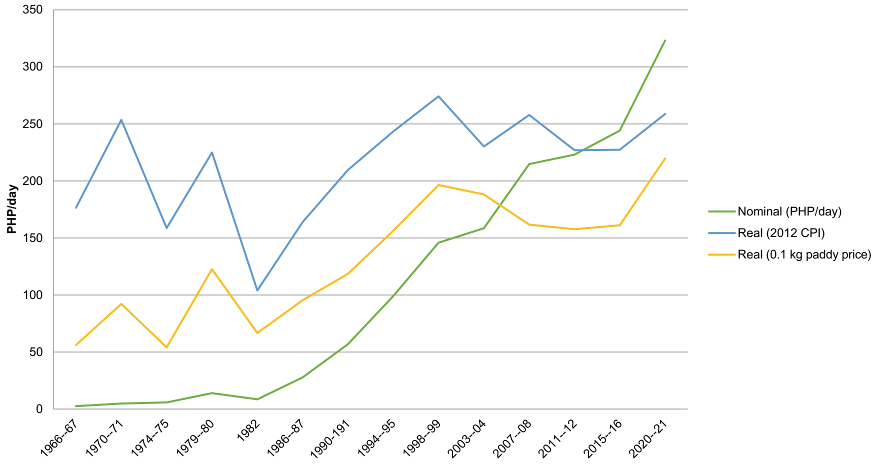

Fig. 3.4 Trends in agricultural labor wage rate, 1966–2021 (Loop Survey for wage and paddy price; Philippine Statistics Authority for CPI)

evidence indicates that, as possible negative effects, external labor activities were restricted, and input and output supply chains had limited activities. Meanwhile, many urban factory workers returned to their rural home villages because of the suspension of factory operations, which might have relaxed labor shortages.

Table 3.3 summarizes the subjective assessments of the aforementioned impacts. Contrary to our initial expectation, less than 15% of the farmers experienced challenges working outside and finding hired labor. Also, only approximately 20% claimed challenges in finding buyers for their harvest. Similarly, only 8% of farmers in the WS and 4% in the DS had challenges accessing chemicals and seeds, whereas 57% and 82% complained of increases in the prices of inputs in the WS and the DS, respectively. Regarding positive effects, approximately 10–20% of farmers recognized an increase in family or hired labor availability. These snapshots indicate that while the pandemic generated an enormous impact on the entire society, its effect on rice farming is limited, seemingly implying relatively stronger resilience of rural livelihoods.

3.4 Conclusion

Rice farming in Central Luzon is at a crossroads. Rice yields have stagnated and have become more variable in the last decade, despite a prompt and continuous switch to newer MVs. We discussed the adoption of labor-saving technologies and mechanization, stagnation of land consolidation and enlargement, increasing labor management challenges, and more rampant natural and human-made disasters. To choose the right direction moving forward from the crossroads, we need further

Table 3.3 Subjective assessment of COVID-19 impact on rice farming, 2020–2021 (The Loop Survey)

	Proportion of 'Yes' among rice farming families (%)	
	2020 WS	2021 DS
Negative effects		
Prohibited from working outside	13	7
Difficulty in finding labor for hire	14	15
Difficulty in finding buyers of harvest	21	21
Difficulty in accessing chemical inputs and seeds	8	4
Increased price of chemical inputs and seeds	57	82
Positive effects		
Increased availability of family labor	11	11
Increased availability of labor for hire	11	20

studies to make rice farming more resilient to rapid demographic changes, rampant disasters, and future pandemics. The Loop Survey can provide important information for this purpose and contribute to drawing useful lessons for Asian countries and show possible future paths for rice-producing Sub-Saharan African countries.

Recollections of Professor Keijiro Otsuka

It is a great asset to my research life that I served as a researcher at IRRI from 2006 to 2012, where Professor Otsuka also served in the 1980s. There I learned the importance of fieldwork and interaction with researchers in other fields. *–Kei Kajisa*

It was an honor for me to know and interact with Professor Kei Otsuka when he was then a Senior Staff and Chairman of the Board of Trustees of IRRI. I learned a lot from his insights and knowledge of IRRI's research and management and how he was instrumental in securing stable funding during his term. *–Piedad Moya*

Professor Otsuka joined IRRI in the mid-1980s, and I was then a research assistant involved in his projects on how technological changes in rice farming affected farmers' socioeconomic conditions in different areas in the Philippines. It was a great learning experience to pick up his approaches to collecting field information. I am greatly honored and privileged to have worked with a well-known economist and one who has a passion for sharing his research knowledge and experiences in his field of expertise. *–Fe Gascon*

Appendix

See Table 3.4.

Table 3.4 Researchers and funding sources of the surveys

Years	Persons responsible	Researchers/Enumerators who conducted the interviews	Funding source
1966–67	Randolph Barker, Stanley Johnson, Ben Hur Aguila	Violeta Cordova	IRRI
1970–71	Randolph Barker, Violeta Cordova	Fe Gascon, Geronimo Dozina, Jr.	IRRI
1974–75	Randolph Barker, Robert W. Herdt, Chandra Ranade	Ricardo Guino, Bonifacio Cayabyab	IRRI
1979–80	Robert W. Herdt, Ricardo Guino, Violeta Cordova	F. Gascon, Dolor Palis, Sylvia Sardido, Perla Pantoja, Aida Papag	IRRI
1982	Robert W. Herdt, Fe Gascon	Dolor Palis, Sylvia Sardido, Perla Pantoja, Leonida. Yambao	IRRI
1986–87	Keijiro Otsuka, Fe Gascon	Dolor Palis, Luisa Bambo, Esther Marciano	IRRI
1990–91	Cristina David, Fe Gascon	Joel Reaño, Alvaro Calara, Luisa Bambo, Milagros Obusan	IRRI
1994–95	Mahabub Hossain, Fe Gascon	Esther Marciano, Joel Reaño	IRRI
1998–99	Mahabub Hossain, Fe Gascon	Joel Reaño, Teodora Malabanan, Aida Papag, Nancy Palma	IRRI
2003–04	David Dawe, Kazushi Takahashi, Fe Gascon	Maria Shiela Valencia, Milagros Obusan, Violeta Cordova, Mary Rose San Valentin	FASID*
2007–08	Kei Kajisa, Pie Moya	Fe Gascon, Mary Rose San Valentin	FASID*
2011–12	Sam Mohanty, Pie Moya	Joel Reaño, Mary Rose San Valentin, Teodora Malabanan	IRRI
2015–16	Kei Kajisa, Pie Moya, Fe Gascon	Mary Rose San Valentin, Teodora Malabanan	JSPS**
2019–21	Kei Kajisa, Pie Moya, Fe Gascon	Mary Rose San Valentin, Teodora Malabanan	JSPS**

Notes * Foundation for Advanced Studies on International Development (FASID), Tokyo, Japan; ** Japan Society for the Promotion of Science (JSPS)

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