



Discovering the Beauty of Agri-Tourism: The Silan AgriFarm's SciCAT Journey

Sheila Elaine D. Silan¹, Edilberto R. Silan¹, Shirley D. Silan¹, Lilibeth P. Novicio^{2*},
Arnelyn S. Romilla², and Ruby A. Manaig²

¹Silan AgriFarm, Brgy. Tambong M. Kulit, Indang, Cavite, Philippines

²Cavite State University, Brgy. Bancod, Indang, Cavite, Philippines

*Corresponding email: scicatsilanagrifarm@cvsu.edu.ph

Received October 3, 2023; Accepted March 13, 2024

ABSTRACT

Filipino farmers remain to be the poorest among the basic sectors in the Philippines. One of the interventions done by the government is the enactment of the Farm Tourism Development Act of 2016. In support to this, the Department of Science and Technology-Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (DOST-PCAARRD) established a Science for the Convergence of Agriculture and Tourism (SciCAT) program for farms. SciCAT is the convergence of science and technology (S&T), innovation in farm techniques and practices, and tourism to showcase the farm's natural beauty and distinct farm experiences through educational and recreational activities. Silan AgriFarm, a 21- hectare agricultural farm, situated at Brgy. Tambo M. Kulit, Indang, Cavite, started as a production farm showcasing dragon fruit as their main commodity. It is owned by Mr. Edilberto R. Silan, a Magsasaka Siyentista (farmer scientist) by the DOST-PCAARRD since 2006. It showcases agricultural innovations for improved and sustainable farm practices. The transformation of Silan AgriFarm into a SciCAT site paved the way for the farm owners to discover the beauty of agritourism as an avenue to a more sustainable livelihood sources and opportunities. From purely agricultural production for income generating purposes, Silan AgriFarm owners were given the opportunity to gradually open their hearts and minds to the world of agritourism and tourism through farm development and technology application. Along with the transformation, due to higher cost of farm inputs, the establishment of a camping site started immediately as an alternative source of income during the off-season. This transformation also led to opportunities to extend Silan AgriFarm's technical expertise to help other farmers to establish their own dragon fruit farms. Likewise, more job opportunities opened to nearby communities, particularly during the COVID-19 pandemic. Silan AgriFarm continues to support R&D activities related to agricultural production and processing for innovation, environmental protection, and profit. Research undertaking on the rehabilitation of the banana plantation at the showcased Banana-Lakatan production technology is being undertaken. Also, in preparation for the desire to venture into a food business, the development of baked and confectionery products using dragon fruit as the main ingredient is underway.

Keywords: farm development, technology application, sustainable livelihood, technical expertise, R&D activities

INTRODUCTION

Filipino farmers remain to be the poorest among the basic sectors in the Philippines based on their poverty incidence value of 30% (PSA, 2015). One of the interventions done by the government to address this issue is the enactment of the Republic Act No. 10816 or the Farm Tourism Development Act of 2016 which provides a comprehensive program for the development and promotion of farm tourism in the Philippines. Farm tourism will serve as a viable means to diversify the income of farmers. It will also

serve as a venue for information sharing and technology transfer for capacitating farmers and orienting tourists on the importance of agriculture. Farm tourism sites can also be an effective platform to showcase agricultural products, both fresh and processed, and agricultural technologies generated by Research and Development Institutes (RDIs) and State Universities and Colleges (SUCs).

The Department of Science and Technology-Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (DOST-PCAARRD) is also mandated by Republic Act No. 10816 to include the technology needs on farm tourism in its Research and Development (R&D) programs in the Agriculture, Aquatic, and Natural Resources (AANR) sectors. In support of this, DOST-PCAARRD sees the opportunity to engage in establishing a farm tourism program by providing a Package of Technologies (POTs) and technology transfer-related services that would maximize the value of the innovations generated from the government-supported R&D projects. The development of farm sites will feature common farm tourism activities such as farm tours, trainings, farm exhibits, pick-and-pay, and other hands-on activities for tourists while promoting the matured technologies developed through the funds provided by DOST-PCAARRD to various RDIs and SUCs that significantly improve farm productivity. With this, DOST-PCAARRD established a Science for the Convergence of Agriculture and Tourism (SciCAT) program for farms or farm sites. SciCAT is the convergence of science and technology (S&T), innovation in farm techniques and practices, and tourism that will enable the farm to showcase its natural beauty and distinct farm experiences through educational and recreational activities.

The Silan AgriFarm in Indang, Cavite, owned by *Magsasaka Syentista* Edilberto Silan, adopts and recognizes recommended agricultural technologies as well as the Cavite State University's (CvSU's) research-generated technologies to further improve his technical capacity and farm productivity. Through capacity building, transfer of technologies, and other relevant assistance, Silan AgriFarm is envisioned to become a SciCAT site by DOST-PCAARRD and later be accredited as a farm tourism site by the Department of Tourism (DOT) that will showcase innovations in agriculture, provide employment opportunities, contribute in the progress of agriculture in the municipality of Indang, the province of Cavite, and the country as a whole.

OBJECTIVE

The paper seeks to present the transformation of Silan AgriFarm into a SciCAT site.

METHODOLOGY

The transformation of Silan AgriFarm which started from August 2018 to December 2023, was executed based on the SciCAT conceptual framework indicating SciCAT as a new technology transfer modality in Figure 1 with Planning, Development, and Sustaining as its three (3) major components.

SciCAT Conceptual Framework [1]

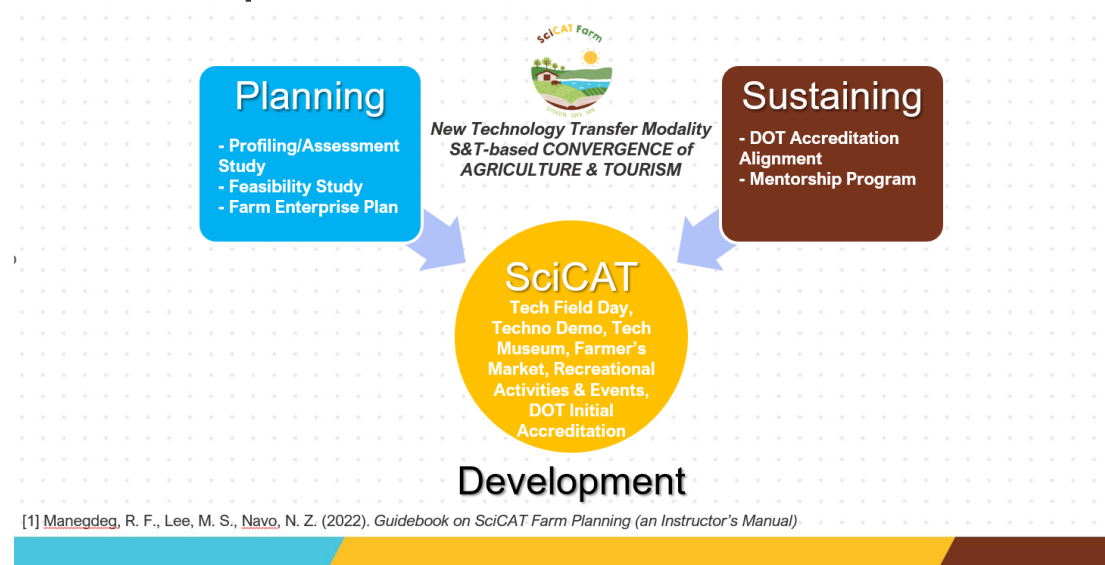


Figure 1. SciCAT conceptual framework

On the other hand, Figure 2 shows the conceptual framework of the actual transformation using the Input-Process-Output (IPO) model. The IPO framework was used to show the process of transforming Silan AgriFarm into a SciCAT site with POTs as main inputs to come up with the expected outputs such as showcased POTs, adopters, technology tours, and others leading to the envisioned increased livelihood sources and opportunities and Silan AgriFarm as DOT accredited farm tourism site.

Strategies of implementation. The transformation was implemented based on pre-implementation and implementation phases.

Pre-implementation phase. Technology and training needs assessments were conducted to determine the agricultural technologies to be transferred to Silan AgriFarm. Likewise, training needs assessment was conducted prior to capacity building of Silan AgriFarm owners and workers, and other stakeholders.

Needs assessment results were examined to identify agricultural technologies and innovations to be downloaded to Silan AgriFarm in addition to the existing showcased PCAARRD- and DOST-supported technologies, as well as those from other RDIs/SUCs which are showcased at the farm. Feasibility studies and farm enterprise planning were also done.

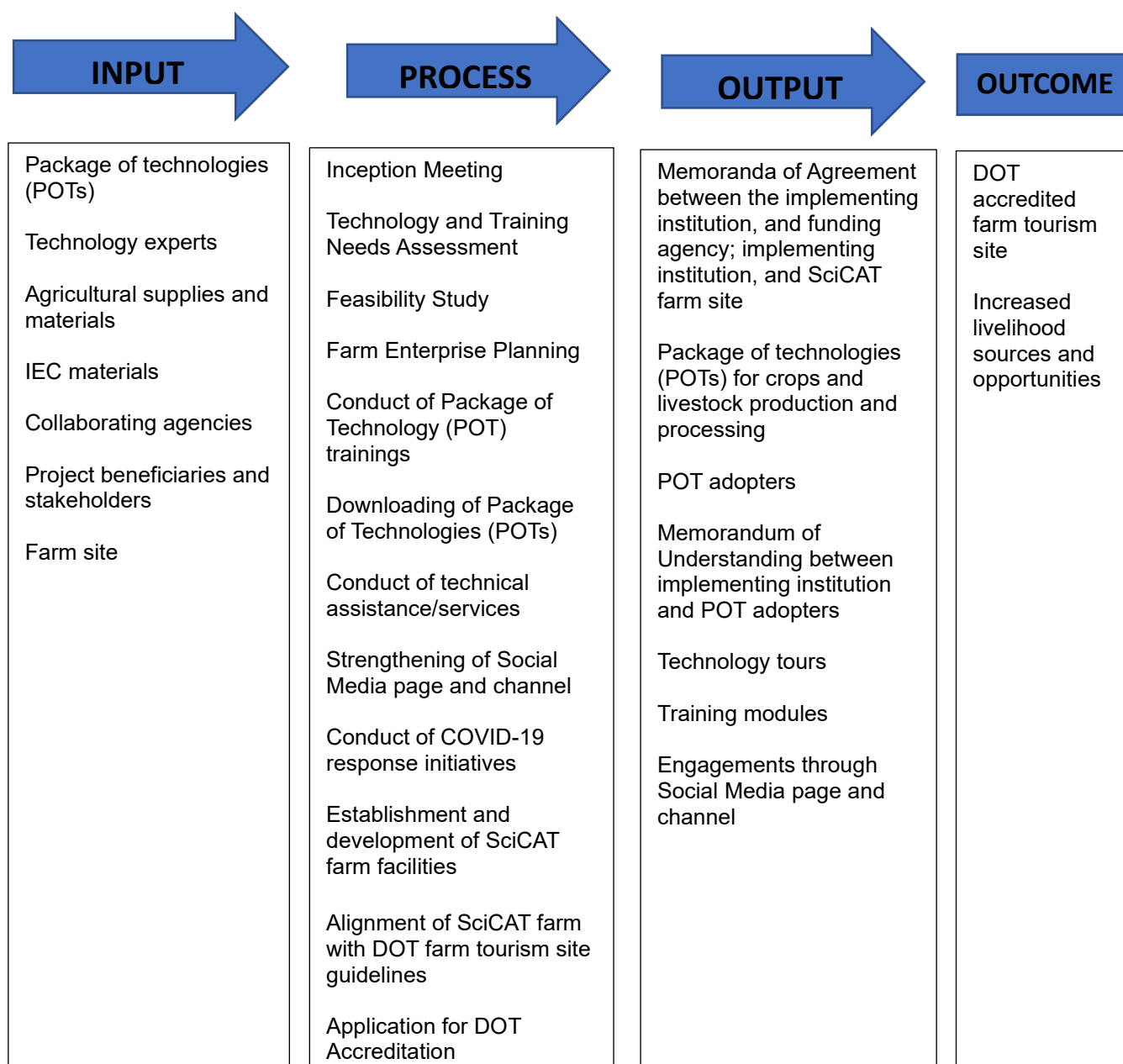


Figure 2. Conceptual framework of the transformation of Silan AgriFarm into a SciCAT site.

Implementation phase. The transformation done during the implementation phase is summarized below.

Capacity building of key stakeholders. Capability enhancement and skills development trainings, seminars, webinars, and workshops in response to recognized needs were conducted. Technical experts were invited from the DOST, the Department of Agriculture-Agricultural Training Institute (DA-ATI), SUCs, local government units (LGUs), and private institutions. Training modules were created for each of the technologies for the benefit of the trainees and future trainers.

Transfer of identified Package of Technologies (POTs). POTs were transferred to Silan AgriFarm. The CvSU assisted the farm in showcasing these technologies through the provision of supplies and materials from the project funds. Prior to the transfer of POTs, skills trainings, seminars/webinars, and workshops were conducted for the Silan AgriFarm owners and workers, and other interested stakeholders.

Monitoring of adopters and provision of technical assistance. Among the trainees, POT adopters were identified, visited, monitored, and provided with technical assistance.

Community awareness campaign. Printed and digital Information, Education, and Communication (IEC) materials were developed and applied for copyright protection. Digital platforms were expanded through the creation of videos and postings. Agricultural technologies, activities, and other information about agricultural production and processing were regularly posted on social media.

Establishment of partnerships. Formal agreements such as a Memorandum of Agreement (MOA) and a Memorandum of Understanding (MOU) were forged with government agencies and adopters.

On-farm and virtual tours. The Silan AgriFarm will offer technology tours highlighting the showcased POTs to farm visitors. Participatory and motivating farm tour packages were created. A few farm visitors were already accommodated following Inter-Agency Task Force (IATF) health protocols.

Evaluation of clients' feedback. Farm visitors' feedback on the farm's services and goods was gathered using a Customer Feedback Survey Instrument.

DOT accreditation. CvSU assisted Silan AgriFarm in the on-line processing of the application for DOT accreditation. The DOT Regional Office staff inspected the farm based on DOT's agricultural tourism site requirements. Completion of facilities and amenities is currently done to comply with other accreditation requirements.

Sustainability plan. CvSU will continue to assist Silan AgriFarm even after the project is completed. With the faculty members and staff's technical skills and knowledge, CvSU will provide technical assistance to Silan AgriFarm by delivering appropriate trainings and other extension services. Existing collaborations will be strengthened to ensure the continuation of collaborative efforts in agricultural development and tourism services. Partnerships with tourism and related offices, such as the DOT, shall be forged to promote and conduct sustainable farm development and tourism promotion and activities. More institutionalized partnerships will be facilitated to ensure sustainable technical assistance from identified RDIs and SUCs. An assessment of the project's economic, social, and environmental impacts will be conducted.

RESULTS AND DISCUSSION

Figure 3 shows the transformation pathway of Silan AgriFarm into a SciCAT site. From purely agricultural production for income-generating purposes, Silan AgriFarm owners were allowed to transform their farm into an agritourism site leading to more livelihood sources and opportunities.

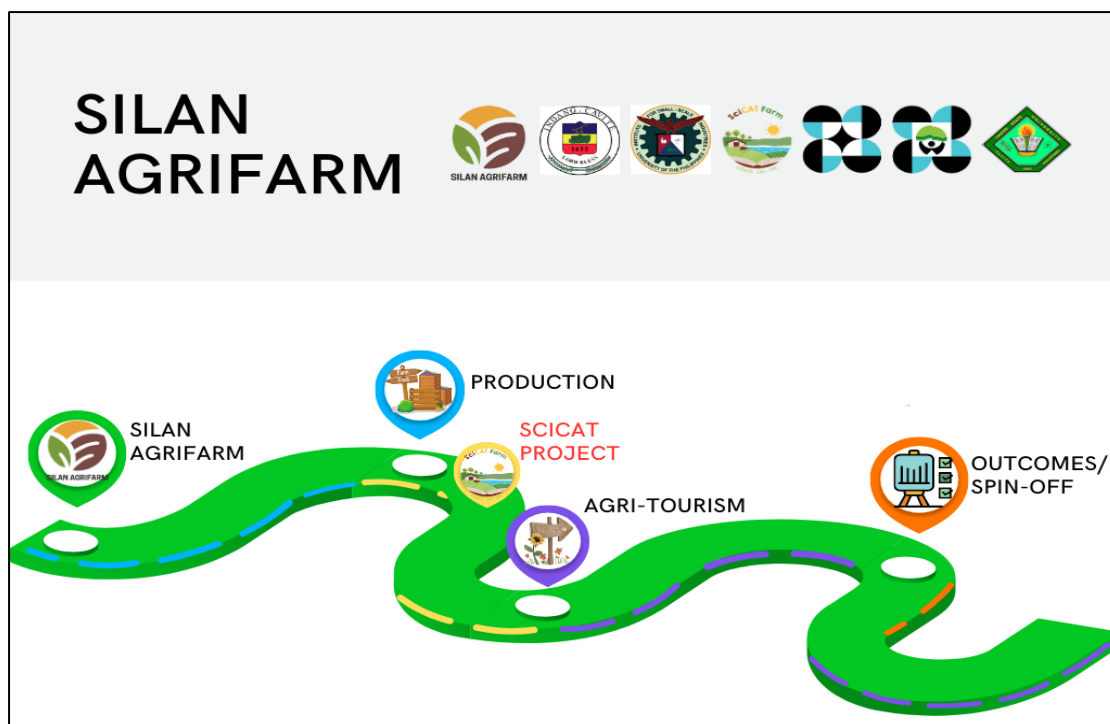


Figure 3. Transformation pathway.

Figure 4 shows the transformation process started with the technology and training needs assessments, feasibility studies, and farm enterprise planning up to initial DOT accreditation.

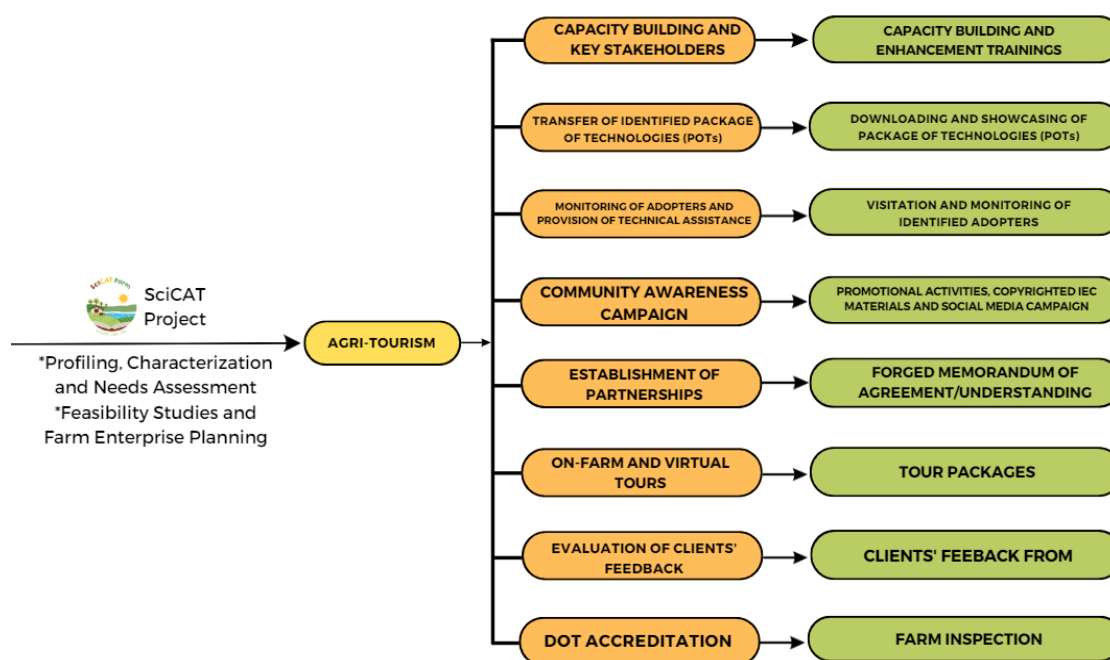


Figure 4. Step-by-step transformation process.

As seen in Figure 5, SciCAT Project initiated capability enhancement for Silan AgriFarm owners and workers, and other interested stakeholders. Technical experts were invited from the DOST, the DA-ATI, SUCs, and LGUs. Training modules were created for each of the technologies for the benefit of the trainees and future trainers.



Figure 5. Capability enhancement and skills development trainings, seminars/webinars, and workshops

For Phase 1, five POTs were downloaded and showcased at the farm, as illustrated in Figure 6, covering the various supply chain segments from technology inputs (drip irrigation technology, native goat production, banana-lakatan production, stingless beekeeping and papaya processing) to production (fresh dragon fruits, native goats, fresh bananas, stingless bee colonies and fresh papayas) to processing (dragon fruit wine, vinegar, jam, soaps, and pickled papaya). Phase 2 focused on six POTs covering technology inputs as well (nursery management, asexual propagation, native chicken production, dragon fruit processing, and vermicomposting technology) production (dragon fruit cuttings and papaya seedlings, ornamental plants, fresh dragon fruits, vermicast, and itik-pinás) and processing (dragon fruit wine, vinegar, jam, soaps). CvSU assisted the farm in showcasing these technologies through the provision of supplies and materials from the project funds.

Table 1. Package of Technologies (POTs) downloaded and showcased.

Phase	Technology inputs	Production	Processing
Phase I	Drip irrigation technology	Fresh dragon fruits	Dragon fruit wine, vinegar, jam, soaps
	Papaya processing	Fresh papayas	Pickled papaya
	Banana-lakatan production	Fresh bananas	-
	Stingless beekeeping	Stingless bee colonies	-
	Native goat production	Native goats	-
Phase II	Nursery management	Dragon fruit cuttings and papaya seedlings	-
	Asexual propagation	Ornamental plants	-
	Native chicken production	Native chickens	-
	Dragon fruit processing	Fresh dragon fruits	Dragon fruit wine, vinegar, jam, soaps
	Vermicomposting technology	Vermicast	-
	Itik-Pinas production	Itik-pinás	-



Figure 6. Package of Technologies (POTs) downloaded and showcased.

Linkages were established by forging MOAs and MOUs with government agencies. A MOA was forged with the funding agency, DOST-PCAARRD while several MOUs for technical assistance were forged with government agencies. As shown in Figure 7, a Municipal Resolution was passed recognizing Silan AgriFarm as one of the agritourism sites in Indang, Cavite, Philippines.

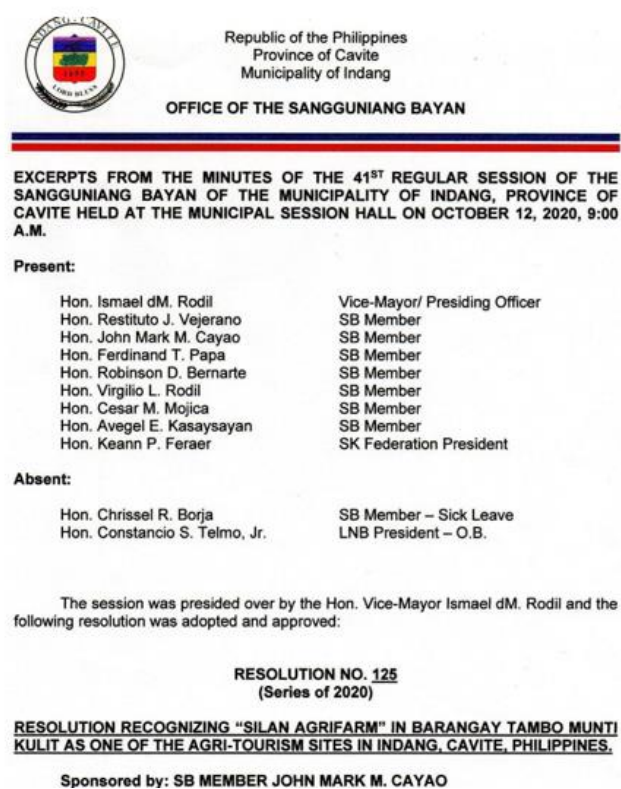


Figure 7. Municipal Resolution was passed recognizing Silan AgriFarm as one of the agritourism sites in Indang, Cavite, Philippines.

Among the trainees, POT adopters were identified, visited, monitored, and provided with technical assistance. Figure 8 shows some of the adopters include Silan AgriFarm, Farmer Abner Javier (goat production), Forever Young Mom's organization (papaya processing), and Avenido and Profeta farms (stingless beekeeping technology).



Figure 8. POT adopters during monitoring and provision of technical assistance.

Printed and digital IEC materials were developed and applied for copyright protection including the Silan AgriFarm Trademark as reflected in Figure 9.



Figure 9. Silan AgriFarm Trademark.

Digital platforms in Figure 10 were expanded through the creation of videos and postings. Agricultural technologies, activities, and other information about agricultural production and processing were regularly posted on the social media.



Figure 10. Social media postings.

The Silan AgriFarm farm will offer technology tours highlighting the showcased POTs to farm visitors. Participatory and motivating farm tour packages in Figure 11 were created. Few farm visitors were already accommodated following IATF health protocols. The SciCAT farm plans to accommodate a maximum of 94 tourists every batch. Google Forms will be used to track customer data. Personal information about clients, Facebook followers and likers, and agricultural relationships, among other things, will be recorded.

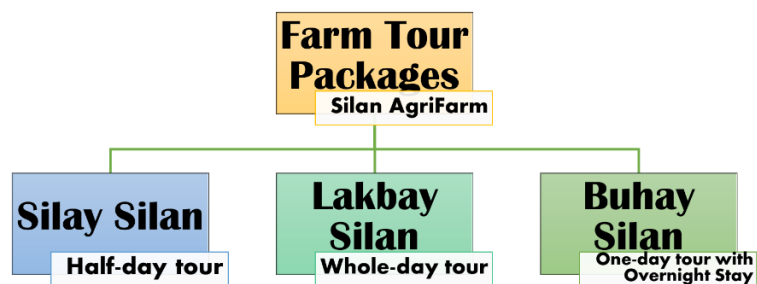


Figure 11. Farm tour packages

For economic sustainability, products were processed to add value to fresh vegetables and fruits. Products include pickled papaya, bitter gourd, and eggplant; dragon fruit vinegar, wine, jam, and shake; and soaps and essential oils in Figure 12. Along with fresh produce, these products are sold in the farm's stalls and during trade fairs and exhibits. The same products will be displayed in their upcoming souvenir shop.



Figure 12. Samples of processed products

The completion of facilities and amenities is currently done to comply with DOT-accreditation requirements as seen in Figure 13.

Feedback of farm visitors on farm's services and goods is crucial, hence a Customer Feedback Survey Instrument was developed and used to improve its goods and services. This is part of the sustainability plan primarily for improvement. Impact assessment on the economic, social, and environmental aspects will also be done.

Existing collaborations will be strengthened to ensure the continuation of collaborative efforts in agricultural development and tourism services.



Figure 13. Newly established facilities and improvements

BEST PRACTICES OF SILAN AGRIFARM

The Silan AgriFarm employs an integrated farming system as reflected in the integration of crops, farm animals, plantation crops, and other systems that benefit and support each other as reflected in Figure 15a. Wastes from fresh produce are processed to come up with value-added products, serve as feeds to farm animals, or are utilized for vermicomposting. Animal manure is mixed with banana stems and other organic materials for vermicompost production. The use of chemical fertilizers and pesticides is reduced by utilizing vermicompost and other organic materials.

Figure 15b shows the best practices of Silan AgriFarm after its transformation into a SciCAT site. Fresh vegetables and fruits are either sold or processed into products while wastes are either processed or fed to farm animals. Fresh stems of dragon fruits and grasses are fed to farm animals, particularly to native goats. With the showcased Native Goat, Native Chicken, and Itik Pinas production technologies, more animal manure is converted into vermicompost through vermicomposting technology.

Additional income was generated from Banana-Lakatan production and ornamental production through asexual propagation technology despite the Banana-Lakatan production being affected by the frequent visits of typhoons. Nonetheless, Banana-Lakatan and other banana stems served as substrates in the production of vermicompost.

The nursery plays a vital role as it houses dragon fruit stem cuttings and banana seedlings either for planting materials or for sale.

Stingless beekeeping, drip irrigation, and artificial lighting technologies contributed positively to the increase in dragon fruit production.

Sustainable farming methods such as crop rotation, drip, and other sustainable irrigation systems, are practiced to promote efficient and environmentally friendly farming systems.

Value-added products from dragon fruit and other fresh produce wastes were processed to increase the market value and longer shelf life.

Moreover, Silan AgriFarm owners regularly conduct strategic planning to evaluate their detailed goals and objectives, and action plans. Strategies were regularly reviewed to keep abreast with the trends and issues in farming and tourism. Teamwork is evident particularly among the farm owners as reflected in their harmonious working relationship and support in the implementation of farming practices and technologies. Above all, Silan AgriFarm owners are generous in sharing information about agricultural technologies, practices, and innovations to the different stakeholders.

The combination of POTs and best practices led to an increase in production and income from fresh and processed products.

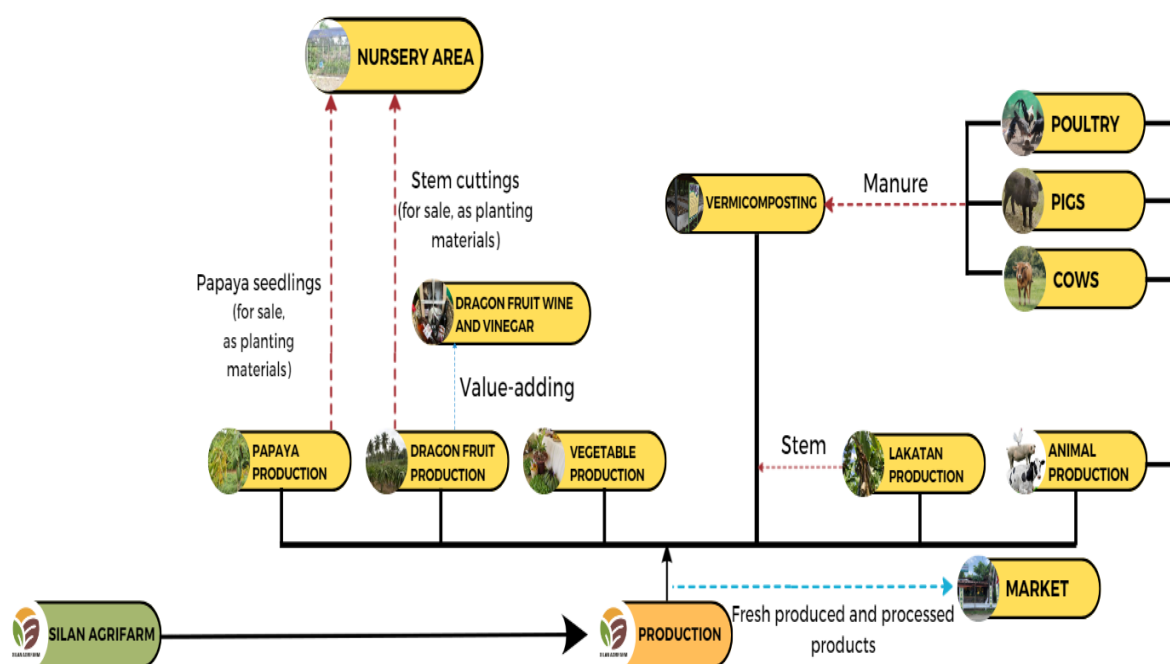


Figure 15a. Best practices of Silan AgriFarm prior to its transformation into a SciCAT site.

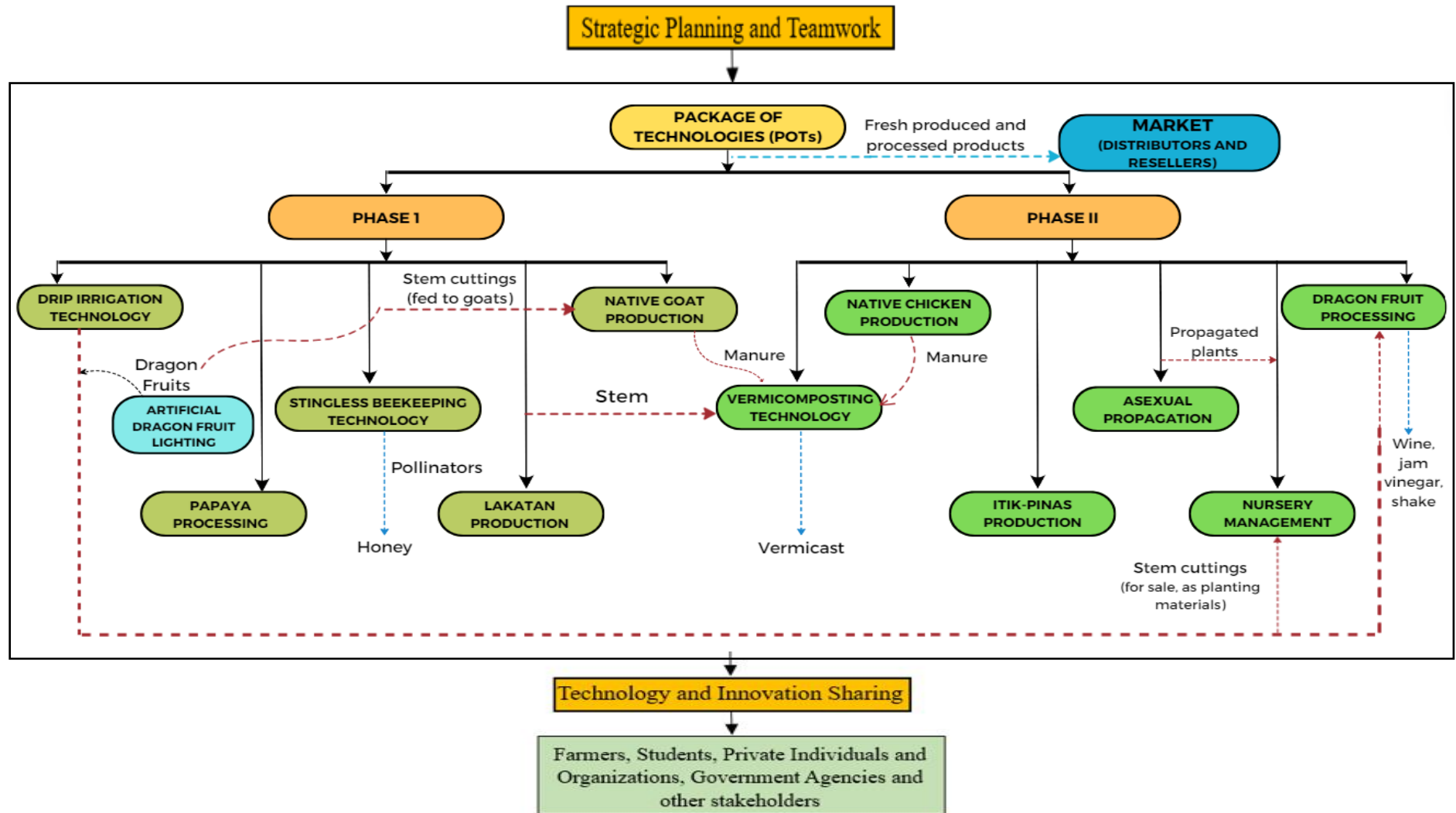


Figure 15b. Best practices of Silan AgriFarm after its transformation into a SciCAT site.

Figure 15a exhibits the best practices of Silan AgriFarm production activities and management while Figure 15b shows the transformation practices of the farm through the SciCAT Project. The figures above are further explained in the table below.

Table 2. Before and after POTs

Commodity	Before the POTs	After the POTs
Papaya	Fresh production	Papaya is processed into pickled papaya
Dragon fruits	Manual watering	Drip irrigation
Fruits and vegetables	-	Presence of stingless bees improved pollination, leading to an increase in production
Ornamental plants	-	Skills in propagating ornamental plants
Native goats	Insufficient knowledge on native goat production	Increase in goat production
Native chickens	Insufficient housing facility for chickens	Constructed recommended housing for chickens
Dragon fruit cuttings and papaya seedlings	Lack of suitable storage space	Utilization of greenhouse
Itik-Pinas	No knowledge on itik-pinas production	Gained knowledge on proper management of itik-pinas
Vermicast	Inadequate facility for vermicomposting	Establishment of vermicomposting facility

OFFSHOOTS/OUTCOMES OF TRANSFORMING SILAN AGRIFARM INTO A SciCAT SITE

Becoming a SciCAT farm resulted in an evolution of Silan AgriFarm as a private firm focused on producing crops into a farm with the purpose of improving itself to be more effective in serving others. First, the farm was able to assist farmers or dragon fruit enthusiasts who wanted to establish their dragon fruit farms. For the owners, having them as the chosen mentors of other farmers is a huge responsibility yet a great opportunity to help others learn and build their successful farms that would help expand the dragon fruit farming industry in the country. Second, there is current research on Banana-Lakatan production with the University of the Philippines Los Baños (UPLB) Technical staff in one of SciCAT's project sites which focuses on microbial inoculants in growing Lakatan bananas that will soon be beneficial to other Lakatan growers. In addition, proposed research is on its way to help dragon fruit farmers add more value to their crop by utilizing the dragon fruits as main ingredient in baked products and confectioneries. Through these partnerships and research, the farm was able to create more jobs not just within the farm itself but also in adjacent communities. In line with this, more people will be given more employment and learning opportunities as the farm started its compliance with the requirements of becoming a DOT-Accredited tourism destination, and eventually become a Technical Education and Skills Development Authority (TESDA)-certified School for Practical Agriculture. There are endless opportunities that came up with these partnerships and transformations. Furthermore, there is a documented increase in productivity of 40%, income increase of 30% to 45% throughout the project implementation and decrease in fertilizer cost input by 70%.

Silan AgriFarm was given a tremendous amount of support for the past years which gave the owners a chance to grow its farm to a more purposeful site. Lastly, with all the assistance, research, and tourism discussions, a proposal to set up a campsite and a cafe is on its way to be built at the SciCAT farm.

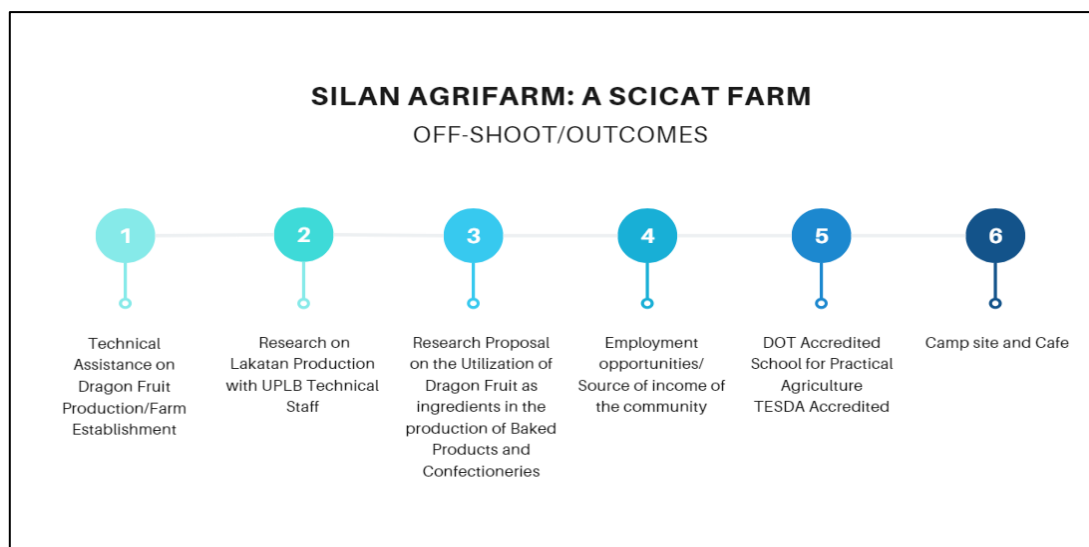


Figure 16. Offshoots/outcomes of transforming Silan AgriFarm into SciCAT site.

CONCLUSION

The transformation of Silan AgriFarm into a Science for the Convergence of Agriculture and Tourism (SciCAT) site paved the way for the farm owners to discover the beauty of agritourism as an avenue to more sustainable livelihood sources and opportunities. From purely agricultural production for income-generating purposes, Silan AgriFarm owners were given the opportunity to gradually open their hearts and minds to the world of agritourism and tourism. Along with the transformation, due to a higher cost of farm inputs, the establishment of a camping area started immediately as an alternative source of income during the off-season. This transformation also led to opportunities to extend Silan AgriFarm’s expertise to help other farmers and farm enthusiasts to establish their own dragon fruit farms. Likewise, more job opportunities opened to nearby communities, particularly during the COVID-19 pandemic.

Silan AgriFarm continues to support R&D activities related to agricultural production and processing for innovation, environmental protection, and profit. In preparation for the desire to venture into a food business, CvSU proposed to develop baked and confectionery products using dragon fruit as a main ingredient for Silan AgriFarm to survive and thrive in competitive markets. Also, research undertaking on the showcased Banana-Lakatan production technology is currently being undertaken with UPLB.

REFERENCES

- Manegdeg, R.F.G., M.L.S. Lee, & N.Z. Navo, 2022. Guidebook on SciCAT Farm Planning (An Instructor's Manual). DOST-PCAARRD and UP-ISSI. VJ Graphic Arts, Inc., Quezon City.
- Mojica, R.S., L.P. Novicio, et.al., 2020. Annual Narrative Report (August 1, 2019 to July 31, 2020) of the project “Transforming Silan’s Farm in Indang, Cavite into Science for the Convergence of Agriculture and Tourism”. Cavite State University.
- Mojica, R.S., L.P. Novicio, et.al., 2020. Annual Progress Report (August 1, 2019 to July 31, 2020) of the project “Transforming Silan’s Farm in Indang, Cavite into Science for the Convergence of Agriculture and Tourism”. Cavite State University.
- Mojica, R.S., et.al., 2019. Annual Narrative Report (August 1, 2018 to July 31, 2019) of the project “Transforming Silan’s Farm in Indang, Cavite into Science for the Convergence of Agriculture and Tourism”. Cavite State University.
- Novicio, L.P., et.al., 2023. Highlights of Accomplishments (January 1, 2023-May 15, 2023) of the project “SciCAT AVENUES: Access to Value-adding and Engaging iNnovations towards sUstainability of agri-Education and agri-touriSm”. Cavite State University
- Novicio, L.P., et.al. 2022. Annual Narrative Report (January 1, 2022-December 31, 2022) of the project “SciCAT AVENUES: Access to Value-adding and Engaging iNnovations towards sUstainability of agri-Education and agri-touriSm”. Cavite State University

- Novicio, L.P., et.al. 2022. Annual Technical Report (January 1, 2022-December 31, 2022) of the project “SciCAT AVENUES: Access to Value-adding and Engaging iNnovations towards sUstainability of agri-Education and agri-touriSm”. Cavite State University
- Novicio, L.P., et.al. 2021. Annual Narrative Report (January 1, 2021-December 31, 2021) of the project “SciCAT AVENUES: Access to Value-adding and Engaging iNnovations towards sUstainability of agri-Education and agri-touriSm”. Cavite State University
- Novicio, L.P., et.al. 2021. Annual Technical Report (January 1, 2021-December 31, 2021) of the project “SciCAT AVENUES: Access to Value-adding and Engaging iNnovations towards sUstainability of agri-Education and agri-touriSm”. Cavite State University
- Philippine Statistics Authority (PSA). 2017, June 30. *Farmers, Fishermen and Children consistently posted the highest poverty incidence among basic sectors – PSA* [Press Release]. <https://psa.gov.ph/poverty-press-releases/pr/2015%20Basic%20Sectors>

ACKNOWLEDGEMENT

The authors would like to convey their heartfelt gratitude to all individuals and organizations who provided invaluable assistance and contributed to the successful implementation of the project.

We extend our sincere appreciation to the CvSU, PCAARRD and PCAARRD -TTPD of the DOST for the opportunity to implement the SciCAT project, and the Institute for Small-Scale Industries of the University of the Philippines (UP-ISSI) and the Municipality of Indang, Cavite for their continuous support to the SciCAT Project and the Silan AgriFarm.

We also recognize the invaluable contributions of the technical experts from CvSU and other government and non-government organizations that helped in the downloading and showcasing of POTs.

Lastly, we express our gratitude to the project team leaders and members, Silan AgriFarm owners and workers and other beneficiaries of the SciCAT Project Phases I and II.

AUTHORS' CONTRIBUTIONS

S.E.D.S. verified data/information and cited best practices; E.R.S. and S.D.S. cited best practices; L.P.N. conceptualized and finalized paper; A.S.R. designed graphics and data consolidation; R.A.M. reviewed and edited the paper; L.P.N., R.A.M., and A.S.R. answered reviewers, revised and finalized paper for publication.

COMPETING INTERESTS

LF and LW declare that they have no conflict of interests.