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COMMERCIAL URBAN AGRICULTURE BUSINESS MODEL STRATEGIES: CITY PROXIMITY AND THE CHOICE OF VALUE PROPOSITIONS

M.M. Rasmuna^{1,2}, VGR Chandran¹, J.S. Keshminder³

*¹ Department of Political Science,
Public Administration and Development Studies,
Faculty of Business and Economics,*

UNIVERSITY MALAYA, 50603 KUALA LUMPUR MALAYSIA

*² Socio-Economic, Market Intelligence and Agribusiness Research Centre,
MALAYSIAN AGRICULTURE RESEARCH AND DEVELOPMENT INSTITUTE*

*³ Faculty of Business and Management,
UNIVERSITI TEKNOLOGI MARA, 40450 SHAH ALAM, MALAYSIA*

Abstract

Driven by urban residents, urban agriculture is advancing Commercial Urban Agriculture (CUA). As CUA evolves within unique geographic and urban settings, there is a necessity to explore sustainable business models. This research employs the Business Model Canvas (BMC) to analyse Malaysia's urban agriculture models, assisting practitioners and policymakers in understanding CUA sustainability. The study reveals that Malaysia's CUA mainly adopts low-cost specialisation, differentiation, and diversification strategies to remain competitive. Distinctive strategies, like organic branding and targeting upscale consumers, bolster farms' market positions. Beyond selling produce, these urban farms enhance their revenue by offering educational programs, food experiences, and leisure activities, thus broadening their economic base. Effective marketing and customer relations cultivate loyalty. Crucially, the findings establish a direct, empirically-driven link between the farm's geographic location (urban vs. peri-urban proximity) and its choice of value proposition strategy, underscoring the significance of spatial planning in CUA's success. This analysis highlights the varied strategies within CUA, emphasising its potential for innovation and long term sustainability.

Keywords: Commercial urban agriculture, urban agriculture, low-cost specialisation; differentiation, Business Model Canvas (BMC).

¹ Corresponding author. Email: vgrchandran@um.edu.my

INTRODUCTION

The rapid expansion of the global population puts a strain on the availability and quality of food, intensifying the worldwide food security crisis (Noraini Omar Chong et al., 2024). Given the United Nations' forecast of 840 million people experiencing food insecurity by 2030, this issue demands urgent international attention. Governments are turning to Urban Agriculture (UA) to modernise farming and build greener cities, encouraging young entrepreneurs to bring fresh energy and tech-savvy ideas to the field (Pölling et al., 2016; Talib, 2019). Malaysia joined this movement with the Green Earth Program and financial incentives to support urban farmers. Recent policies focus on using technology, attracting younger talent, and upgrading infrastructure, all aiming to grow high-value, sustainable commercial urban agriculture (CUA) businesses and create better jobs (Department of Agriculture, 2016; MAFI, 2021). Crucially, this pivot is essential, as rapid Malaysian urbanisation characterised by agricultural land loss and a diminishing rural workforce acutely threatens national food security (Marzuki and Jais, 2020).

However, the successful implementation of CUA policies requires filling strategic knowledge gaps, as business models are central to its success. Recognising that business models are central to CUA's success, researchers have explored which models thrive in different urban settings, since factors like population density and local business climates shape these choices (Liu, 2015; Pölling et al., 2016, 2017; Robinson et al., 2017; Van der Schans, 2010, 2015; Van der Schans et al., 2016; Zasada, 2011; Mougeot, 2000). It has overlooked the critical, granular relationship between a farm's specific geographic proximity (urban vs. peri-urban) and its choice of value propositions in the context of rapidly developing Southeast Asian cities. Therefore, this study examines how Malaysian urban farms adapt with competitive business models, aiming to answer who their customers are, what those customers value, and how farms can deliver value at the right cost (Casadesus-Masanell and Ricart, 2010). The goal is to suggest targeted interventions to strengthen CUA.

This study offers practical insights for policymakers, investors, and entrepreneurs on choosing effective urban agriculture (UA) business models suited to Malaysia's unique context. By examining how different strategies work within Asia's diverse ecosystem, it fills key research gaps and builds on global business model literature (Casadesus-Masanell and Ricart, 2010). The paper is structured as follows: Section 2 presents the theoretical framework, Section 3 covers research design, Section 4 discusses results, Section 5 explores implications, and Section 6 concludes.

THEORETICAL FRAMEWORK: URBAN AGRICULTURE BUSINESS MODEL

More than just producing food, UA focuses on creative business strategies that enable farms to thrive in urban environments (Boons and Lüdeke-Freund, 2013). A business model explains how farms create, deliver, and capture value (Osterwalder and Pigneur, 2010), making it vital for success. As UA grows worldwide, researchers have identified several key business models (Van der Schans et al., 2016). Initially, three primary categories were established: low-cost specialization, differentiation, and diversification. Two supplementary categories, "the commons" (centered on shared ownership) and "experience" (focused on social or ecological benefits), were later incorporated to broaden the scope of the framework

Key Business Models

- Low-cost specialisation: Farms focus on a few high-value crops, like fresh fruits and vegetables, aiming for efficiency and lower costs (Gardner, 1994). This model works best on the urban edge where space allows for scale (Busck et al., 2006).
- Differentiation: Urban farms offer unique or niche crops and keep supply chains short, building direct relationships with customers and allowing premium pricing (Van der Schans, 2010). Vertical integration—from growing to processing and marketing is key.
- Diversification: Farms combine food production with services like education, leisure, or tourism, creating multiple income streams (Bryant et al., 2013). This model is popular as urban land gets scarcer and supports multifunctionality (Van der Schans, 2010).

Other models include shared ownership or “the commons,” and farms that prioritise social, ecological, or sensory experiences (Van der Schans, 2015). Researchers have also noted “innovative” and “experimental” models, characterised by advanced techniques and new marketing approaches (Pölling et al., 2015). However, these often blend with the main types above.

In summary, most urban farms rely on low-cost, differentiated, or diversified models to compete and adapt in a challenging city landscape, often mixing elements to suit their needs.

RESEARCH METHODOLOGY

Research Design

To investigate urban farm business models, this study used multiple qualitative case studies and semi-structured interviews (Yin, 2018). This method effectively

captures urban farmers' experiences and supports the exploration of new business model narratives (Merriam and Tisdell, 2015).

Framework and Interview Questions: The Business Model Canvas

This study used the Business Model Canvas (BMC) to analyse urban farm business strategies, following established frameworks (Zott et al., 2011; Lambert and Davidson, 2013; Osterwalder and Pigneur, 2010). The BMC's nine building blocks (customer segments, value proposition, channels, customer relationships, revenue streams, key resources, key activities, partnerships, and cost structure) guided the semi-structured interview questions. To ensure relevance and validity, questions were reviewed by subject experts, and ethical clearance was secured from the University Malaya, Malaysia Research Ethics Committee (UMREC). Informed consent was gained from all participating urban farmers prior to their inclusion in the study, and efforts were made to preserve their confidentiality.

8. Key partnership The network of suppliers and partners that make the business model working	7. Key activities The most important activities a company must do to make its business model working	2. Value proposition The bundle of products and services that create value for a specific customer segment	4. Customer relationship The types of relationships a company establishes with specific customer segments	1. Customer segments The different groups of people and organisations that the company aims to reach and serve by its products and services
	6. Key resources The most important assets required to make a business model working		3. Channels How a company communicates with and reaches its customer segments to deliver value proposition	
9. Cost structure All costs incurred to operate a business model		5. Revenue streams The cash a company generates from each customer segment		

Figure 1: The Business Model Canvas (BMC) with its nine building blocks
Source: Osterwalder and Pigneur (2010)

Sampling

Commercial urban agriculture (CUA) involves farming in urban or peri-urban areas to generate income from agricultural products and services (Sroka et al., 2021). Also called "professional UA" (Pölling et al., 2016) or "metropolitan agriculture" (Heimlich, 1989), this model is relatively new in Malaysia, where there is no central record of farm locations. This study used purposive sampling to include farms from both urban and peri-urban areas, especially in the Klang Valley—the country's largest urban centre and a leader in UA policy (Mohamad Shukor, 2020; Shahbaz et al., 2016). Farms needed at least one year of experience. The sample was built using online searches, conventions,

recommendations, and help from MARDI. Out of 21 contacted, 16 farm owners agreed to participate, with 14 based in urban and 2 in peri-urban locations.

Data Collection and Analysis

Data were collected through face-to-face and online interviews with farm owners, necessitated by pandemic restrictions (Patton, 2015). Rapport was established beforehand via WhatsApp and phone calls. Interviews were recorded and transcribed verbatim. Thematic analysis followed Braun and Clarke's (2006) six steps, with Nvivo software supporting coding and peer review ensuring rigour (Creswell and Poth, 2018).

ANALYSIS AND DISCUSSION

Results and Discussion

The analyses involved 16 commercial urban farms in Malaysia (see Table 2), with 14 farms emerging from the urban and 2 peri-urban areas, respectively. Of the 16 farms, 2 were low-cost farms, eight were differentiated farms and 6 were diversified farms. While the differentiated and diversified farms concentrated their activities on the nearby densely populated areas, the low-cost farms' locations have smaller population densities. The average farm sizes and jobs is greater in low-cost farms, followed by diversified and differentiated farms. For annual average sales, the earnings are almost comparable for both low-cost and diversified farms despite the smaller size of diversified farms. This is because diversified farms can charge higher prices on their tradable and non-tradable high-end products and services. The organic farming technique is apparent in most farms, with both the low-cost farms interviewed relying on soil-based organic farming. For the differentiated farms, an indoor vertical farming technique was popular, while the diversified farms exhibited a preference for indoor hydroponic and aquaponic farming techniques.

Table 2: Key Characteristics of the Interviewed Urban Farms

Key Characteristics	Low-cost specialised farms	Differentiated farms	Diversified farms
Number of farms	2	8	6
Average farm size [Sq. ft]	1,001,980.00	976.00	16,603.33
Average number of jobs [full-time equivalent]	30	3	6.17
% of average job intensity [(number of jobs/Sq. ft) x 100]	0.003	0.3	0.04

Key Characteristics	Low-cost specialised farms	Differentiated farms	Diversified farms
Average annual sales [RM]	1,900,000.00	503,000.50	1,800,261.33
Technique/System [number of farms]:			
Conventional	-	1	-
Indoor farming	-	7	3
Vertical farming	-	6	1
Hydroponic	-	4	3
Aquaponic	-	1	3
Organic	2	3	4
Biodynamic	1	-	-
Permaculture	-	-	1
Precision farming	-	1	1

Note: Total 16 farms: 14 urban farms and 2 peri-urban farms

Source: Authors' elaboration

Table 3 classifies the urban farms into “low-cost specialisation,” “differentiation,” and “diversification” business model. Analysis of the nine segments of BMC clearly show that urban farms, while having their foci, are taking advantage of their resource endowments to capture features of different business models to diversify their revenue streams. The detail synthesis of low-cost specialised, differentiated and diversified farms is presented in the following sub-subsections.

Table 3: Synthesis of Low-Cost Specialised, Differentiated and Diversified Farms

	Low-cost specialised farms	Differentiated farms	Diversified farms
Customer segments	- Organic food/vegetable wholesalers - Families/Youth requesting leisure/recreational activities - Children willing to learn farming and explore vegetables	- Hotels - Fine-dining restaurants - Catering companies - Restaurants - Organic conscious households - Corporate & female clients requesting interior landscape - Organic shops/retailers	- Restaurants - Families seeking quality family time - Children seeking fun farm activities - Young couples - Wholesalers - Urban farmers (professional, community & hobby) - Organic shops - Export orientation - Farm equipment suppliers/vendors - Education institutions

	Low-cost specialised farms	Differentiated farms	Diversified farms
Value proposition	- Organic vegetables - Fresh vegetables - Clean environmental practices (biodynamics) - Experience connection with nature - Accessibility to green landscape - Own organic branding	- Freshness - High-quality organic vegetables (organic branding) - Close customer relationship - Competitive price - Lower risk (lower product default and greater shelf life) - Convenient location - Product variety - Fast delivery - Customer experience (pick own vegetables) - On-demand vegetable cultivation service	- High-quality organic vegetables - Close customer relationship - Newness of concept - Competitive price - Environmentally friendly products & processes - Convenient location - Organic brand - Product variety - Customer experience (ambience, activities, self-service & service quality) - Community bonding - Education
Channels	- On-farm - Organic food/vegetable wholesalers - Supermarkets - Small sellers	Direct - On-farm - Web sales - Facebook shop - Farmer's market - Sales during events Indirect - Supermarket - Distributors - Stockiest - Organic store - Online grocer	Direct - On-farm - Own store - Web sales - Facebook shop - Farmer's market - Sales during events - Mobile application Indirect - Organic store - Online grocer
Customer relationship	- Personal to organic food/vegetable wholesalers - Personal assistance for recreational/leisure activities	- Personal assistance (individual basis) - Self-service - Co-creation - Offering club membership - Social media community (Facebook & Instagram)	- Personal assistance (individual basis) - Dedicated personal assistant - Self-service - Social media community (Facebook & Instagram)
Revenue streams	- Direct sale (wholesalers) - Fees for services (leisure & recreational)	- Direct sale - Short supply chain - Partial sales to other buyers of the value-added chain	- Product sales - Fees for services (leisure, recreational, education & training)

	Low-cost specialised farms	Differentiated farms	Diversified farms
	- High turnover per farmland unit		
Key resources	- Land - Modified farming technique/method - Irrigation infrastructure	- Land - Farm infrastructure - Strong partnership (trust) - Networking - Knowledge - Business plan (competitive edge) - Modified farming technique/method - Workers - Financial - City proximity	- Land - Farm infrastructure - Strong partnership (trust) - Networking - Business plan (competitive advantage) - Modified farming technique/method - Workers - Financial - City proximity
Key activities	- Production of local organic vegetables - Composting - Educational tours - Camping activities - Direct sales - Vegetable product combo	- Agricultural activities (microgreens, edible flowers, local & special vegetables, seafood, livestock, edible plants and ornamental plants) - Product sale from own farm (including vegetable basket) - Product sales from other suppliers - Educational services (talks & book authorship) - Farm/herbs garden setting-up service - Sale of portable home farming system	- Agricultural activities (microgreens, local & special vegetables, seafood, edible plants, & heirloom plants) - Product processing (organic sauces & fruit jam, pickling, dried fruits, healthcare products & farm equipment and materials) - Product sale from own farm - local craft & souvenir - Educational services (training, workshops, entrepreneurship programs & book authorship) - Setting up farms and therapy gardens - Rent a field - Farming system and supplies - Restaurant - Composting - Heritage projects
Key partnership	- Coopetition: Organic wholesalers - Buyer-supplier relationship: Seeds, input providers for organic fertilizer & farming equipment	- Strategic alliances: Hotels, retailers & vendors - Coopetition: Vendors - Buyer-supplier relationship: Seeds, fertilizers, organic	- Strategic alliances: local entrepreneurs & agencies. - Coopetition: competitor - Buyer-supplier relationship: Seeds, fertilizers, organic products, suppliers & farming equipment

Low-cost specialised farms		Differentiated farms	Diversified farms
		products, edible plants, ornamental plant suppliers, LED grow light & farming equipment	- Plastic industry - Professional urban farmers - Government - Associations
Cost structure	- Fertilizer - Irrigation system - Wages	- Seeds - Fertilizer - Utilities (water, electricity & rental) - Wages - Product packaging - Grow mat - Planting pot - LED grow light - Farming system & infrastructure	- Seeds - Fertilizer - Utilities (water, electricity & rental) - Fish feed - Wages - Product packaging - LED grow light - Farming equipment & materials - Farming system & infrastructure - Water filtration system

Source: Authors' elaboration

Low-Cost Specialised Farms

The location of low-cost specialised farms plays a pivotal role in their operational success, with many strategically situated at the urban periphery to optimise both spatial resources and proximity to consumers. These enterprises typically concentrate on the cultivation of high-value organic vegetables for a niche market, establishing robust relationships with wholesalers who contribute to efficient production planning and uphold stringent quality standards.

To stimulate future demand, select farms have diversified their activities by integrating agrotourism initiatives—such as offering camping facilities and culinary experiences utilising farm produce—while others deliver training programmes aimed at educating local stakeholders about organic agriculture and fostering investment partnerships. The ability of these farms to diversify is closely linked to the characteristics of their land; those endowed with scenic landscapes are more likely to engage in tourism-related ventures, whereas others emphasise training and collaborative models.

Despite the increased costs associated with organic farming methods—including investments in sustainable practices, infrastructure, and labour—these farms remain committed to ecological stewardship and the consistent delivery of high-quality produce. Central to their approach are strategies centred on community engagement, sustainability, and continuous innovation.

Differentiated Farms

Figure 2 shows the key features of differentiated farms. Differentiated urban farms achieve success primarily through direct sales to consumers, hotels, and restaurants, utilising on-farm transactions and online platforms as principal distribution channels. By prioritising high-value crops such as microgreens and speciality vegetables, these operations cater to the distinct preferences of chefs and health-conscious clientele who are inclined to invest in superior freshness and quality.

The cultivation of close relationships is pivotal in this business model. Farms engage directly with chefs and households, tailoring produce offerings and providing distinctive experiences, including on-site farm visits. Their strategic placement within affluent neighbourhoods or urban centres enables these farms to attract customers who seek a diverse selection of organic products. Additionally, many farms expand their product range by retailing supplementary organic goods, thereby enhancing their market position.

The onset of the COVID-19 pandemic compelled many farms to accelerate their adoption of digital sales channels, and the resilience of their established customer relationships facilitated a swift post-pandemic recovery. Despite incurring elevated operational costs—particularly investments in specialised infrastructure and premium seeds—these farms distinguish themselves through continuous innovation, strategic collaboration, and the cultivation of loyal partnerships within niche markets.

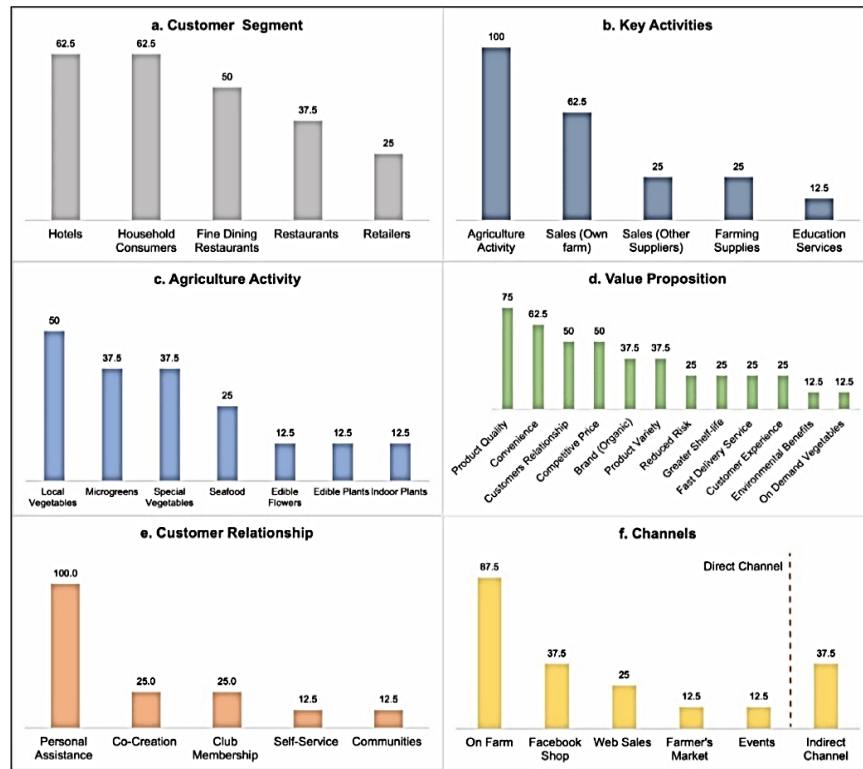


Figure 2: Key features of differentiated farms

Source: Interview and fieldwork

Diversified Farms

Diversified urban farms in Malaysia expand beyond crop production by offering business services—especially education, gastronomy, and leisure—which create economic and social value. Education is central: farms run training sessions and structured entrepreneurship programs, often collaborating with universities, hospitals, and NGOs to promote urban agriculture. These initiatives foster community engagement, equip aspiring growers, and encourage health-conscious habits. Gastronomical experiences, such as farm-to-table restaurants set in tranquil, out-of-city locations, allow families to enjoy organic food and participate in farm activities. These venues embrace sustainability through zero waste practices and recycled materials, while also providing unique experiences like petting zoos and hands-on workshops. By diversifying services, farms reach new markets and encourage innovation in equipment and processes, often partnering with suppliers to manage costs. This multi-faceted approach not only strengthens buyer-supplier relationships but ensures continued relevance in a niche market. Ultimately, diversified urban farms succeed by blending education,

culinary experience, and sustainable practice, positioning themselves as resilient, community-focused businesses despite high initial investments.

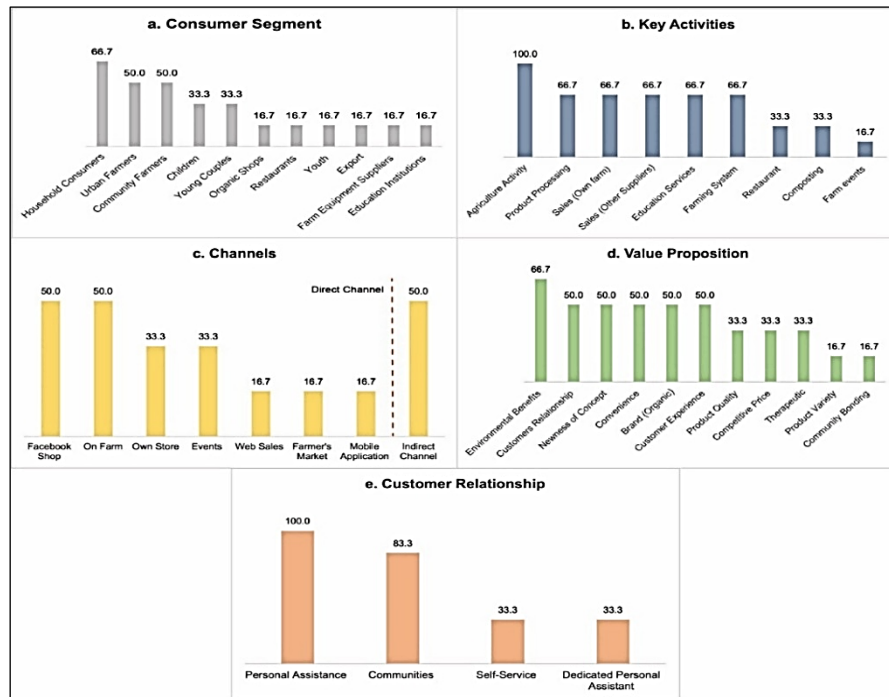


Figure 3: Key features of diversified farms
Source: Interview and Fieldwork

Managerial and Policy Implications

Drawing on these findings, we propose targeted policy and managerial strategies to unlock urban agriculture's potential. Policymakers are encouraged to pilot recommended measures and strengthen the sector's impact.

Low-Cost Specialised Farms

Low-cost specialised farms in Malaysia combine large-scale production with agritourism, leveraging peri-urban locations near tourist attractions to reach families and capitalise on local demand. These farms use soil-based organic methods, producing vegetables noted for their flavour and nutrition, and often offer educational experiences for visitors.

To address infrastructure and operational costs—such as irrigation on challenging terrain and manure management for animal farming—government support and public-private partnerships are essential. Expanding into local fruits, animal products, and on-site farmers' markets can further draw visitors and

diversify income. Involving the Federal Agricultural Marketing Authority (FAMA) can help with marketing and distribution, while direct engagement in farmers' markets builds brand loyalty and strengthens connections with consumers.

Overall, these farms succeed by linking production scale with tourist experiences, fostering innovation, and collaborating across sectors to boost competitiveness and resilience in the urban agriculture sector.

Differentiated Farms

Differentiated farms are poised to feed growing urban populations and boost agribusiness exports. To shift from small-scale models to innovative plant factories—especially in urban centres—government support is essential, including grants, subsidies, and access to underutilised facilities. These farms thrive by focusing on high-value crops for premium markets, maintaining direct customer relationships, and embracing new technologies like AI to enhance the customer experience. Professional training and strategic partnerships are needed for export success, given that many farmers are self-taught. Notably, differentiated farms adapted well during the COVID-19 pandemic by offering contactless and cashless services. Their business models must deliver unique, hard-to-replicate value to remain competitive (Zott and Amit, 2008; Teece, 2010).

Diversified Farms

Diversified farms in Malaysia focus on transforming their agricultural produce into unique, high-value products, often pairing this with leisure and gastronomic experiences for urban residents. While funding for large-scale research and development is limited, government support—such as grants, partnerships with local enterprises and universities, and export promotion—can drive innovation and quality improvements. Strategic location planning within cities is key to accessibility and brand differentiation. These farms also provide training and serve as hubs for community-supported agriculture, linking local engagement with food security and profit potential. To sustain growth and avoid supply disruptions, collaboration between farms, policymakers, and training providers is essential. Although COVID-19 posed challenges for on-site research, adherence to strict methodology and data triangulation helped ensure reliable findings. Diversified farms thus play a vital role in urban agriculture's resilience and innovation (Zott and Amit, 2008; Teece, 2010).

CONCLUSION

This paper uses the BMC to analyse how CUA creates, delivers and captures value. Key findings of the study are as follows: First, organic branding and

targeting of high-end consumers are essential business strategies for differentiated and diversified farms. This strategy allows the farms to remain competitive while fetching higher profits and innovating to offer high-value products and services. Second, location is central for all business models to expand their revenue stream. While low-cost farms prefer peri-urban areas to experience scale economies, differentiated and diversified farms favour sites closer to cities and towns to expedite economies of scope through networking and unique business propositions. Third, farms from all three categories exhibit close customer relationships and use multi-channel marketing strategies to deliver quality and convenience value propositions. Lastly, a major farming diversification strategy is via educational services, recreation retreats and gastronomical experiences.

The study contributes to policy experimentation and provides useful managerial implications. The study creates an avenue for future research to develop a structured questionnaire covering a larger sample to comprehensively evaluate the commercial agriculture business models. This study provides an exploratory background, and it is limited to the selected case study.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal connections that might have influenced the research presented in this publication.

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