SUCCESS IN CONTROLLED ENVIRONMENT AGRICULTURE: IT'S THE CONTEXT THAT COUNTS

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Less than 50 % global land surface is suitable for crop production. Controlled environment agriculture (CEA) has been investigated to address agricultural challenges. CEA can enhance production in cities and isolated locations. Limited research on context-specific factors of success in CEA has been done, however. This research identified factors associated with successful CEA projects. Systematic review repositories were searched to identify prior work to avoid study duplication. Next, academic databases were searched to crystallize success as defined in agriculture, engineering, and business over time. The search identified themes for a survey of vertical farm stakeholders. Results showed that CEA projects operate in social systems with multiple dynamics. Differences existed between successful agricultural and non-agricultural businesses, though some commonalities could be applied across industries. Business success varied based on personal identity and experience. Economic or financial indicators of success included productivity, profitability, return on investment, turnover, market share, and succession potential. Some agricultural stakeholders also highlighted psychosocial measures such as passion, work-life balance, lifestyle alignment, outside interests, family relations, independence, and autonomy. Engineers highlighted task measures such as the Iron Triangle to assess success based on project delivery on time, under budget, and to predetermined quality specifications. These results showed that interdisciplinary approaches to understanding different approaches to CEA and vertical farming are needed to determine how success is defined and whether those conditions are likely to be met. This work provides the foundation for future studies of what makes CEA successful and how that success is measured.