

Beyond milk collection: Can Indonesian dairy cooperatives lead the sustainable record-keeping transition?

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The study aims to assess cooperatives' capacity to enhance farmers' record-keeping as a pathway to supporting sustainability initiatives in the Indonesian smallholder dairy sector. We identify the cooperatives' roles particularly in record-keeping practices, and explore the challenges encountered. Despite their close relationship and regular interaction with the farmers, Indonesian dairy cooperatives have not yet fully realized their potential to transform record-keeping practices.

The study involved five dairy cooperatives located in Bandung, Bogor, Boyolali, and Malang. Data collection combined a questionnaire survey of 80 farmers, farm observation of 10 farmers, and in-depth interviews with 12 stakeholders representing cooperatives, milk processing industries, farmer associations, government, and universities. Data were analyzed using descriptive statistics, percentages, multiple response analysis, and multinomial logistic regression. Qualitative interview transcripts were coded through thematic analysis. To map its influence in record-keeping practices, cooperatives' positions were classified using a power interest matrix. Building on this classification, fuzzy logic analysis was then implemented to assess stakeholder salience by identifying the relationship between power and interest and illustrating it through a fuzzy logic decision surface.

All cooperatives involved in this study provided record-keeping facilitation for their farmers, but the data collected still focused on bulk milk sales per farm rather than performance data such as milk production per animal or reproduction indicators (insemination dates, pregnancy results, calving records, etc.). Two out of five dairy cooperatives have already implemented digital record-keeping. The results from the power-interest matrix showed that cooperatives are positioned as key players that have high interest and high power. In addition, the fuzzy logic decision surface illustrated that the cooperatives have high power (4.13/5), interest (4.36/5), and salience (4.27/5). Nevertheless, the findings from the thematic analysis revealed that cooperatives face challenges with technical capacity for livestock data management and insufficient infrastructure resources. Realizing this potential, even though cooperatives are well positioned to drive improvement, requires technical capacity building in livestock data management, better infrastructure, and a commitment to reorienting record-keeping practices not only for transactional but also for breeding-oriented data that support farm sustainability.