

Influence of Process Plan on Agricultural Cooperative Societies Performance in Kenya

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Authors' contributions

This work was carried out in collaboration among all authors. Author JN designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Authors CA and EW managed the analyses of the study and literature searches. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/SAJSSE/2019/v3i230100

Editor(s):

(1) Dr. Velan Kunjuraman, Lecturer, Faculty of Hospitality, Tourism and Wellness, University Malaysia Kelantan (UMK), Kelantan, Malaysia.

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Complete Peer review History: <http://www.sdiarticle3.com/review-history/46505>

Original Research Article

Received 28 October 2018

Accepted 10 January 2019

Published 27 March 2019

ABSTRACT

Process plan implementation plays a key role in the organizational performance especially the coffee cooperative societies. Coffee cooperative societies enable the pooling of resources towards betterment of livelihood of rural folk particularly the farmers. The study was carried out in order to establish the level of contribution of process plan towards the performance of agricultural cooperatives specifically the coffee cooperative societies in Trans Nzoia County, Kenya. The study utilized structured questionnaire administered to 346 coffee farmers. The respondents were arrived at using purposive and simple random sampling techniques. Data were analysed using Spearman's correlation coefficient together with regression. It was established that process plan had positive statistical significance on the organizational performance ($P < 0.05$), hence community development practitioners and agricultural extension officers should enhance utilization of process plan in the agricultural cooperative societies.

Keywords: Rural development; agriculture; production; performance.

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1. INTRODUCTION

Implementation of process plan provides guided working methods in a diverse manufacturing and production environment [1]. According to Agriculture and Food Authority, AFA [2], Trans Nzoia coffee cooperative societies have performed poorly for the last two decades leading to poor and delayed payment to farmers, increased cost of production, reduced coffee quality, reduction of membership as well as closure of five cooperatives. This is a scenario that is common in the country since late 1980's. The dismal performance may be attributed to the weak link between the coffee cooperative societies operations and process plan implementation. It is therefore prudent that the processes in the coffee cooperative societies which includes budgeting, activity schedules and investment choices are well planned and implemented to ensure sustained production and viability of the societies hence improved rural livelihood economy. Gacheru [3], affirms that the key reason of the organizational failure is lack of or deficiency in the process planning which is very important in reduction of the delay rate, costs and other execution activities [4,5,6].

A well-managed process plan improves production performance of an industry and institutions. The optimal production performance parameters in the coffee industry are optimal processing capacity of the cooperative society, reduced cost of coffee production, matching qualification of process handlers, good quality of the coffee produced and increased production efficiency. The focused coffee process production methods to be considered include cherry sorting processes, cherry pulping, parchment drying, transporting and payment rate and time to the members [7,8,9].

Quality of processed coffee and timeliness of the payment remittances to the farmers is critical to the coffee cooperative industry where process planning decisions significantly affect the process outcome by influencing the timing, costs, quantity production, quality production, payment rate and energy used in the processing activities. Process planning implementation may help in creating opportunities for increased performance of coffee production and may be a way of reducing total operation cost as well as increasing the income paid to the farmers with consistency of payment [10,11,12].

Despite the importance of process planning on the performance of the coffee cooperative societies, Trans Nzoia County cooperative societies seems weak in the implementation of process plan in their operations, a situation which could be attributed to the poor performance of the Coffee cooperative societies and even to an extent of complete closure of some societies. Most research has been done on the factors affecting the performance of the coffee cooperative societies with little research on the contribution of process plan implementation on organizational performance of the coffee cooperative societies, which this research attempted to establish [13].

The purpose of the study was to establish the extent to which process plan implementation influenced organizational performance in the coffee cooperative societies in Trans Nzoia County. The research was guided by a conceptual framework that indicates that process planning in the coffee cooperative societies has an influence on the performance of the said societies by way of improvement of the operations and coffee quality enhancement. The coffee quality is further enhanced by operations necessitated by qualified and competent staff that are engaged in a more competent way and also by retention of the already experienced staff in the organization.

The process plan in the coffee cooperatives are categorised into budget making and subsequent following processes, activity plans and adherence of schedules to the later and determining the investment choices while maintaining the already chosen investment decisions. The budget making by the qualified staff in the cooperative must be activity based to enhance fund utilization and reduce financial resource waste. Activities scheduled by the cooperatives need to be timely in delivery of cherry to the factories, with timely sorting by the employees of the cooperatives together of which should be coupled with timely pulping in order to reduce quality waste at the factory level. Good storage of the pulped and dried coffee is a key principle so that secondary defects are reduced to the minimum possible level. The processed coffee needs to be timely delivered to the dry mills so that secondary dry milling could be done and prompt quick delivery to the national coffee auction and subsequent payment of the proceeds to the farmers who deliver coffee to the coffee cooperative societies.

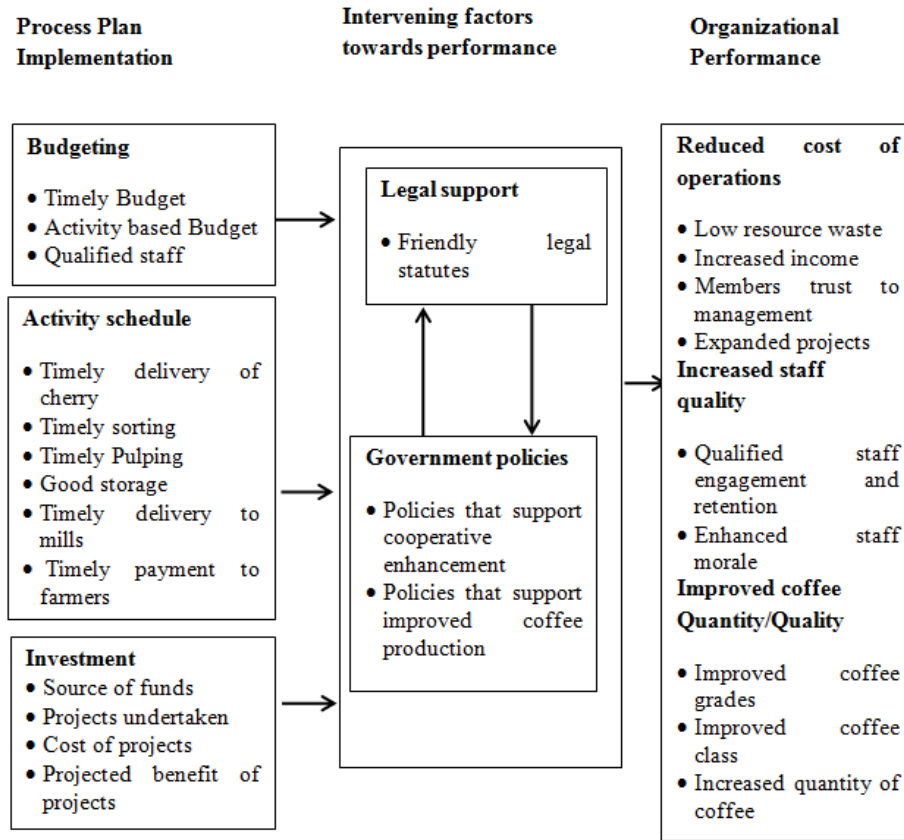


Fig. 1. Conceptual framework

2. RESEARCH METHODOLOGY

The study was carried out in Trans Nzoia County in Kenya with a total coffee farmer population of 3,274 that derived a sample size of 346. The research was correlational and it employed cross sectional survey using self-administered structured questionnaire. Sampling of small-scale farmers was done purposively followed by random selection of respondent sample size of 346. Data were analysed descriptively and through correlation coefficient based on a 0.05 level of significance.

3. RESULTS

3.1 Influence of Process Plan on General Performance of the Coffee Cooperative Societies in Kenya

General performance of the coffee cooperative societies were tested based on different aspects as shown in Table 1 and results showed that gender participation influence performance in

terms of level of coffee quality measured in classes in a scale of 1-10 where 1 is best and 10 is worst and has statistical significance ($r = 0.143$, $P < 0.05$), However results indicated non statistical significance in process plans formulation, the level of milling loss achieved and duration to payment of farmers upon delivery of coffee to the factory ($r = 0.042$, $r = 0.03$, and $r = 0.079$ respectively with $P > 0.05$). Gender category indicate the source of energy levels present which determines the available labor force and skills that moderate the quality of the processed coffee owing to timeliness, efficiency and effectiveness. Cultural orientation and different roles in the society of gender determines the timeliness of efficiency of coffee cooperative society operations which further affect the quality of the coffee offered for the market.

On age influence to the operation of the coffee cooperative societies, it was found to have statistical significance on process plans formulation and types ($r = 0.497$, $P < 0.05$), milling loss level ($r = 0.687$, $P < 0.05$) and

duration of payment to farmers ($r = 0.544, P < 0.05$). However, it did not show any statistical significance on the coffee bean class ($r = 0.04, P > 0.05$) an indication that the class difference was likely to emerge from other factors not directly related to age of the respondents and by extension the members of the cooperative societies as shown in Table 1.

Position in the society had significance difference on the consideration as an ingredient for performance improvement ($r = 0.217, P < 0.05$), respondents also considered process plans as a factor that leads to a better coffee class ($r = 0.116, P < 0.05$), results further reveals that milling loss could significantly be affected by process plans ($r = 0.427, P < 0.05$) as well as influence the duration of coffee payment from the time of delivery to the factory for pulping and other primary processing related activities.

Research sought to find out the influence of duration as a member in the society and how they viewed process plans in accordance to performance improvement, coffee class type, milling loss and duration towards payment of delivered coffee. Results established that the number of years in a cooperative society influenced the view towards performance improvement ($r = 0.451, P < 0.05$), similarly, respondents differentiated by the duration they had been members of a coffee cooperative society considered process plans as a factor that could not influence the coffee class in the factory in anyway ($r = 0.039, P > 0.05$). However, the respondents based on their time as members of cooperative societies considered process plan as facilitating improvement of organizational performance through an improved milling loss ($r = 0.594, P < 0.05$) and duration of payment of delivered cherry for primary processing ($r = 0.513, P < 0.05$) as shown in Table 1.

Table 1 further shows correlation coefficient findings on educational qualification of the respondents on process plans influence on the performance of the organizations specifically the coffee cooperative societies was sought and results indicated that education qualification had indeed a positive view on the improvement of the performance especially the coffee class ($r = 0.140, P < 0.05$) and milling loss ($r = 0.210, P < 0.05$). On the other hand the respondents viewed, based on educational qualification that process plans had no influence on the organizational performance ($r = 0.049, P > 0.05$) and duration of payment by the society to its

members on the delivered cherry ($r = 0.087, P > 0.05$).

On types of plans that were available and how they affected the performance of the cooperative societies, results indicated that there was statistical significance influence on the existing plan and the performance especially on the improvement of performance within the cooperative society and its clients ($r = 0.263, P < 0.05$), milling loss ($r = 0.261, P < 0.05$) and duration of payment ($r = 0.196, P < 0.05$), however, results showed no statistical significance between process plan existence and coffee class in the coffee cooperative society ($r = 0.089, P > 0.05$).

3.2 Multiple Linear Regression on Process Planning Effect on Performance of Organizations

Regression findings as shown in Table 2 indicate positive influence of the three process plans of interest to the performance of the coffee cooperative societies. The coefficients are 0.217 as constant, 0.298 for activity schedule, 0.257 for Investment process plans and 0.146 for Budget and budgeting process plan.

4. DISCUSSION

The purpose of the study was to establish the extent of contribution of process plan implementation on the organizational performance in the coffee cooperative societies in Trans Nzoia County. It is agreeable that the purpose of formation of coffee cooperative societies is to facilitate production, processing and marketing of coffee in a better way and to improve the timeliness of income level of the farmers. While this is a key reason, there has been poor response to the members of the coffee cooperative societies hence low performance despite many efforts to improve the performance socially, economically and agriculturally by key stakeholders in the industry. Literature cites many cooperatives in the world being in poor performance state averaging below 50% performance coupled with a myriad of challenges ranging from poor attitude, lack of commitment by leadership, poor governance, low capital base and corruption vice, insufficient knowledge and skill. This situation is replicated in the research findings where payment time averages half a year with better quality of coffee being class 3 and average of class 4, which is an average class, and attracts average prices in the

market. Coffee cooperative societies carry out several activities about coffee, which has several stages, and attract resource use variedly, hence need continuous process planning to enable it to be sustainable in terms of profitability and customer satisfaction. Process planning includes all the activities necessary for coffee processing and other related activities and for the production of high quantity and quality coffee, thus increased income.

Research findings confirms that process Planning implementation is important in the utilization of new technologies; equipment processes and in enhancing product performance while on the other hand increases probability of profitability and sustainability of the coffee cooperative societies. Efficient process planning function addresses the management of information regarding equipment, timing, strategy, processing and projects. Contemporary operation technology is constantly changing human operational skills required and because of intense professional activities involved in various operations, it has called for intelligence in judgment and decision-making on its implementation at the expense of strength power and is particularly relevant in coffee processing industry.

Implementation of process plan provides guided working methods in a diverse manufacturing and production environment. A Well-managed process plan improves production performance of an industry and institutions. The optimal production performance parameters in the coffee industry are improved processing capacity of the cooperative society, reduced cost of coffee production, matching qualification of process handlers, good quality of the coffee produced and increased production efficiency. Process plan helps organizations to sustain themselves through understanding the environment of operation and adopting technologies that puts it relevant. Coffee Product quality remains the key indicator and responsibility of the cooperative society as a processing organization. Quantity of coffee produced is the volume of coffee processed in a given time span, hence the capacity of the factory in the cooperative society. Volumes of coffee to the cooperative society are dependent on the delivery by the smallholder farmers based on their production and membership, the higher the volumes the greater the performance and operations. Coffee processing exhibits Intermittent type where it is carried out when on

season, normally once a year for around five months depending on weather conditions and changes.

It is prudent not to underestimate that successful practitioner and organizations understand the power of commitment and strive to keep focus on the goals of the organizations for the success of own and company activities. Understanding organizational goals and planning for its achievement based on diverse operational situations in the prevailing competitive environment require basic scientific insight in its application and knowledge management. Coffee cooperatives are basically formed to identify and respond to the ever-changing needs of its members and surrounding while considering evolving agricultural structural dynamics. Effectiveness of cooperative society response to the business environment depends on process planning in terms of its position, flexibility, and influence towards the market.

The findings affirm that coffee cooperative societies are instrumental in ensuring smooth production processes through orderliness, stable operations and utilization of existing management skills. Cooperative societies endeavor control of operations costs, efficient use of resources and coffee quality focus, which is key through deliberate financial control and allocation. The coffee cooperative process plan is formulated to reduce cost and improve quality of coffee parchment and Mbuni. The eminent costs that organizations try to minimize include production costs, storage costs, tardiness costs, non-delivery costs, handling costs, costs for increase in resource capacities, transportation costs and costs for increases in storage capacities.

Coffee processing management includes receiving cherry at the factory level, cherry pulping, parchment washing, parchment drying, storing and delivery to the mills for hulling. It is therefore the responsibility of the management to implement the process plans properly in order to achieve an efficient and smooth flow of the processes. Factory Plant operation includes determining the time and day of machine operation, washing and drying sequence, and finding appropriate time of delivery to mills. Coffee Produce management involves coordinated flow and inventory of various stages of the products. Coffee cooperative society activity scheduling is the process of developing and maintaining best optional tactics and operational plans, in order to achieve higher

value of the coffee process. In determining the best option to be chosen, constraints and resource scarcity is critical consideration. Activity schedule and implementation capability in a coffee cooperative society is directly related to management willingness and support of the key stakeholders in the industry.

Based on the research findings a research model was developed indicating linkages of schedules towards the level of performance by the coffee cooperatives societies. The summary therefore indicates that budget as a process plan influence the performance of the cooperative societies positively upon which its absence affects the performance negatively. Budget influence on performance of the organizations is measured in

terms of timeliness, cost of operation, quality of product and confinement to scope of operations. Similarly, budget has an influence on investment decisions and activity scheduling processes. Activity scheduling existence and implementation contributes positively on investment plans as well as organizational performance measured in timeliness, cost of operations, quality of products and scope. Furthermore, investments plan existence and implementation influences positively on activity scheduling and organizational performance in any organization. The lack of the plans influences negatively on the performance of the organizations especially the coffee cooperative societies as illustrated in Fig. 2.

Table 1. General performance considerations based on process plans

		Process plans improve performance	Coffee class	Milling loss	Duration for payment
Gender	Pearson Correlation	0.042	-.143*	-0.03	-0.079
	Sig. (2-tailed)	0.449	0.01	0.588	0.154
Age	Pearson Correlation	-.497**	0.04	.687**	.544**
	Sig. (2-tailed)	0	0.468	0	0
Position in cooperative society	Pearson Correlation	.217**	-.116*	-.427**	-.385**
	Sig. (2-tailed)	0	0.036	0	0
Years as member	Pearson Correlation	-.451**	0.039	.594**	.513**
	Sig. (2-tailed)	0	0.481	0	0
Educational qualification	Pearson Correlation	-0.049	.140*	.210**	0.087
	Sig. (2-tailed)	0.37	0.011	0	0.114
Types of plans in existence	Pearson Correlation	.263**	0.089	-.261**	-.196**
	Sig. (2-tailed)	0	0.112	0	0

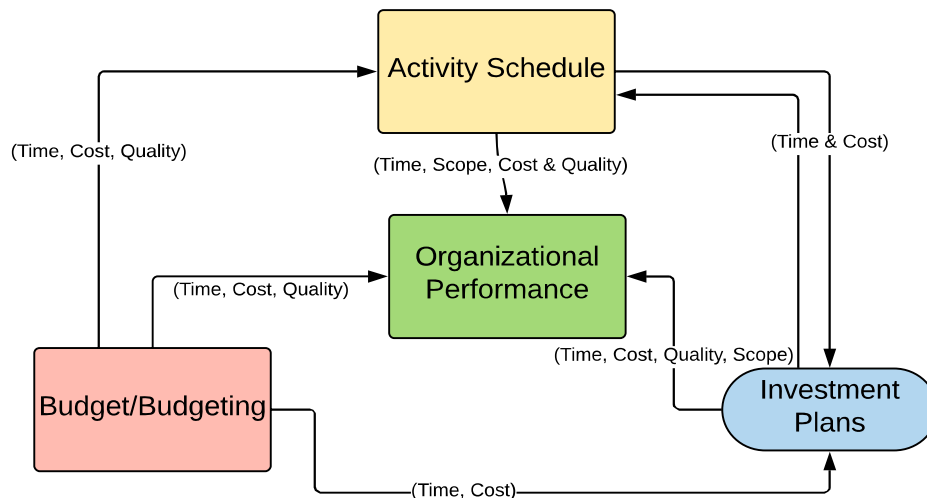


Fig. 2. Research model

Table 2. Regression findings

Model	Unstandardized coefficients		Standardized coefficients
	B	Std. error	Beta
(Constant)	.217	.125	
Existence of activity Schedule	.255	.050	.298
Aware of Investment	.272	.053	.257
Budget Existence	.124	.049	.146

Research findings can therefore be put in a model of

$$\gamma = \beta + X + \epsilon$$

where;

- γ = the performance levels
- β = the constant/slope/gradient
- X = the variables
- ϵ = the error

hence the generalized model arrived was

$$\gamma = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \epsilon$$

where;

- γ = Performance level
- β_0 = Constant/slope/gradient/Coefficient
- β_1 = Coefficient of activity schedule in an organization
- β_2 = Coefficient of awareness of investment level in an organization
- β_3 = Coefficient of budget Existence in an organization
- X_1 = Existence of activity schedule in an organization
- X_2 = Awareness of investment level in an organization
- X_3 = Budget Existence in an organization
- ϵ = Error

From the regression model findings, it can therefore be concluded that

$$\gamma = 0.217 + 0.298X_1 + 0.257X_2 + 0.146X_3$$

Hence each of the variables have a positive influence on the performance of the coffee cooperative societies with activity schedule being with higher influence, followed by the investment

plans and budget existence having the least influence of the three interest research areas.

Hence it may be summarized as in the equation and Fig. 2.

$$P_{Performance} = A_{activity\ schedule} + B_{Budgeting} + I_{Investment}$$

$$P = ABI$$

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusion

Processes are at the core of the coffee cooperatives societies business and therefore process planning and management can best be used as a tool for maximizing the success of cooperative society operations. Implementation of process plans follows the principles of project planning and management and cuts across all projects while recognizing individual uniqueness. For the success of organizations in their operations and goal achievement, timely communication, established control mechanisms, established feedback capabilities, troubleshooting enhancement, proper coordination, timely decision making process, monitoring and evaluation measures in place, proper process/project organization, and management experience of the leaders of an organization.

Process planning is an essential ingredient in the performance of the coffee cooperative societies and organization in general. Every coffee cooperative society ought to inculcate the process plans specifically the budget and budgeting, activity schedules and investment plans in order to provide guidance towards achievement of the goals and building confidence of the stakeholders.

5.2 Recommendations

The study provides highlights and general observation on the contribution of process planning on the organizational performance in the coffee cooperative societies. The role of process plans can significantly contribute positively to coffee cooperatives organizational performance. The results and research findings of the data analysis indicated that cooperative societies which are high performing essentially are those that creates and utilize process plans for organizational leadership, responsibilities accomplishment and those who possess skills and trainings required for the formulation and utilization in the organizations.

The findings of this research indicate that the contribution of process plans is directly and positively related to coffee cooperatives societies business performances. The determining factors towards effective coffee cooperative societies business performance are budget and budgeting, activity scheduling and investment planning all of which provides guided operations leadership and defined responsibilities between the managers of coffee cooperative societies and defined clear demarcated transparency, accountability and leadership among stakeholders.

Basic principles of planning and management in the coffee cooperative societies are very critical in achieving the goals and objectives of coffee cooperative organization as was in its formation of enhancing coffee production, processing and marketing. The key problems of coffee cooperatives operations are the management of coffee processing activities, financial management and making timely and effective decisions. The findings therefore indicated that organization that followed the principles of process planning had better choices when it came to activity choices and investment choices. It is of essence to utilize participatory process plans in every stage and aspect of coffee cooperative society.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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