Journal of Organisation & Human Behaviour
8 (4) 2019, 09-19
http://publishingindia.com/johb/

# EFFECTS OF MEMBERS' RELATIONSHIPS ON LAW-ENFORCEMENT EFFECTIVENESS AND PERFORMANCE IN PROTECTED AREAS

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**Abstract** *This study was set to assess protected area staff' interpersonal and intergroup relationships effect on patrol effectiveness and performance. Our findings showed members assessed their teams with high scores for interpersonal and intergroup relationships. The four patrol teams showed differences in team performances in the number of patrols organised, number of hours spent on patrols and its resultant effective patrol days (EPDs) achieved per staff. Teams that scored highest in team purpose, goals and roles as well as team skills and competencies were found to spend much more time on patrols. There were no statistically significant variations among the teams' interpersonal and intergroup relationship versus (1) team purpose, goals and roles, (2) team skills and competencies and (3) team learning and commitment in a Kruskal-Wallis H test. However, there were statistically significant differences among the four teams in the number of animals sighted and illegal activities detected in ANOVA tests. These variations were attributed to ecological conditions rather than differences in the teams' effectiveness scores.*

**Keywords:** *Biodiversity, Ecological, Illegal Activities, Patrol Teams, Poaching*

## INTRODUCTION

The utilisation of groups as work teams is increasingly being applied to improve performance in organisations and communities. Scott and Pollock (2006) stated teams are becoming important work performance units, which hugely affect the level of productivity in organisations. Team building passes through five stages, which comprise forming, storming, norming, performing and adjourning phases (Nazzaro & Strazzabosco, 2009). According to the authors, each phase must be managed well, particularly the storming stage because it is a conflict-prone phase. Wang and Liu (2007) stated team conflicts must be identified promptly and resolve to harness benefits to organisations. Leicht et al. (2007) also mentioned that three different types of conflicts exist within teams. They are relational, task and process conflicts. The authors stated that an extreme negative inter-relational conflict adversely impact teams' effectiveness and performance; however, process and task conflicts could be beneficial if managed well.

Scott and Pollock (2006) stated work teams have inherent values that benefit employees and response to clients' needs. The combine application of individuals' professional knowledge, skills and attitudes enables them to function effectively for their own benefit and their organisations (Baker et al., n. d; Paolucci et al., 2018). Each team has its differences; however, all teams have four common attributes according to Baker et al. (n. d). These attributes are: (1) teams consist of more than one individual, (2) they have a common goal, (3) team members' tasks are interdependent and (4) teams have a desired end to achieve.

Effective teams are developed from a group of individuals through highly interactive processes among members. McEwan et al. (2017) mentioned it is not just enough to assemble skilful individuals to perform tasks; rather, it requires the members working together to achieve the organisational goals. Nazzaro and Strazzabosco (2009) had made similar statement that the interactions among group members create team dynamics and those dynamics must be managed effectively. Again, the levels of individual members' cooperation, trust and communication affect teams' effectiveness and performance (Leicht et al., 2007; Bell et al., 2018).

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Measuring work teams' effectiveness is inherently subjective (Paolucci et al., 2018). Generally, team's effectiveness can be determined by measuring productivity, members' satisfaction and level of achievement of the desired goal (Scott & Pollock, 2006). Thus, some common variables in measuring teams' effectiveness include team performance, collective efficacy, group cohesion and member satisfaction. However, the concept of team performance measures has been central in most studies (McEwan et al., 2017).

This study assessed four different patrol teams' effectiveness at the Gbele Resource Reserve (GRR) in northern Ghana, against key performance indicators of the total number of patrols organised, hours spent on patrols and EPDs achieved/ month. Team performances' variations in the number of animals sighted and illegal activities detected during patrols were determined.

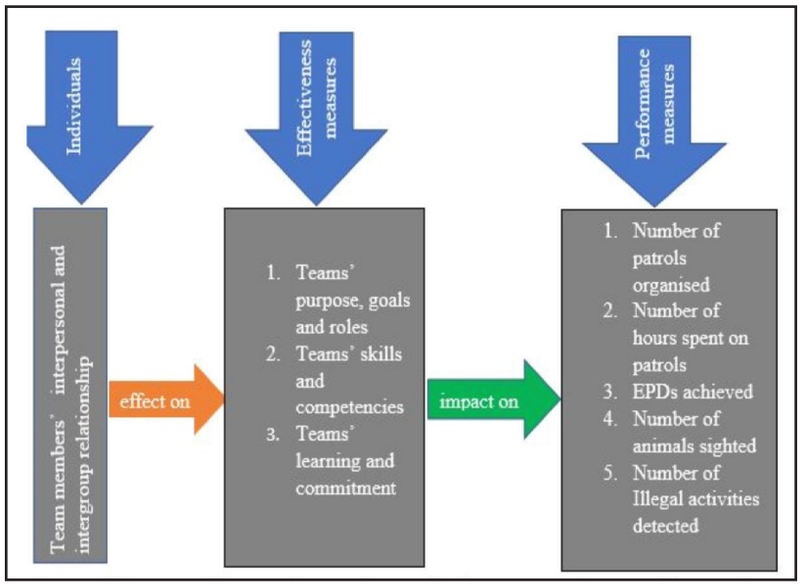
The objective was to assess patrol teams' effectiveness, which is essential to improving the sustainable management of protected area biodiversity against illegal use (Galvin et al., 2009). The assumption is that all the four patrol teams of the GRR received similar and equal support (ration, arms and ammunition, Global Position Systems and other personal protection equipment) needed for effective patrols. Four research questions were asked for this study.

- What level of effectiveness do patrol team members assign to their teams?
- What differences exist among patrol teams in the number of patrols organised, number of hours spent on patrols and EPDs achieved?
- How do interpersonal and intergroup relationships affect (1) team purpose, goals and roles, (2) team skills and competencies and (3) team learning and commitment?
- How do the number of (1) patrols undertaken, (2) hours spent on patrols, (3) EPDs achieved, (4) number of animals sighted and (5) illegal activities detected statistically vary among patrol teams?

The purpose is to understand how patrol teams' interpersonal and group relationships affect patrol effectiveness and performance. Earlier researchers have written on patrol team performances but not from the perspectives of patrol team composition and effectiveness (Jachmann, 2007; Agro et al., 2017; Wiafe, 2017). This study was conceptualised on protected area patrol team members' perspectives on their clarity of (1) purpose, goals, roles, (2) skills and competencies (3) commitment and learning and (4) how these are associated with team members' interpersonal and intergroup relationships.

## Theoretical Framework for the Study

McEwan et al. (2017) categorised team members' behaviour into those that affect task and teamwork. In this study, patrol team task includes all the technical competencies of team members used to undertake effective patrols to deter and arrest poachers to secure biodiversity (Jachmann, 2007). It also includes the ability to detect all illegal activities and identify biodiversity species and their conditions during patrols. Patrol performance analysis consists of teams' preparation, actual patrol execution and patrol outcomes (Wiafe, 2017).




Source: Author

**Fig. 1: Framework for Assessing Patrol Team Effectiveness on Performance**

Technical core competencies of team members are required to prepare, execute and reflect on patrols' outcomes (Frankfurt Zoological Society, 2014). Also, positive interpersonal relationship is essential to keeping members to patrol effectively (Leicht et al., 2007; Agro et al., 2017). McEwan et al. (2017) stated quality interpersonal relationship is the binding factor among team members that translates logistics into performance. For example, for patrol teams to reach specific Global Positioning System (GPS) coordinates planned before patrols, quality interpersonal relationship is needed together with technical competencies.

Fig. 1 shows a framework for interpersonal and intergroup relationships' effects on patrol team effectiveness and performance designed for this study.

Interpersonal and intergroup relationships cohesiveness is affected by individual members' values, interests and preferences (McEwan et al., 2017; Paolucci et al., 2018). Individual team members' attributes' effect on patrol preparation is reflected in team purpose, goals and roles in this study. Actual execution of patrols on the field is reflected by the team skills and competencies and reflections on team performances is represented by team learning and commitment in this study.

# MATERIAL AND METHODS

This section describes the study location and the methods applied in data collection. Data analysis processes are also outlined in this section.

## Study Area

Gbele Resource Reserve lies in the Upper West Region of Ghana and its vegetation is guinea savannah woodland. The Reserve is situated between latitude 10° 22' N and 10° 44' N and longitude 2° 03' W and 2° 12' W with a land coverage of 565 $km^2$ and a perimeter of 126.1 km (The Wildlife Division, 2018). A number of wildlife species occur in the reserve which attract poachers (Oppong & Woebong, 2015). Key plant species known to occur are Vitellaria paradoxa, Pterocarpus erinaceus, Anogeissus leicarpus, Mitragyna innermis and Combretum collinum. Major animal species include Kobus ellipsiprymnus, Tragelaphus scriptus, Ourebia ourebi, Chlorocebus sabaeus, Hippotragus equinus, Syncerus caffer and Orycteropus afer.

## Data Collection

Data were collected from both primary and secondary sources. Patrols are generally organised at the camp level where the camp leader and patrol leader determine locations for patrols in their beat/range (Jachmann, 2007; Wiafe, 2017). However, under special circumstances (usually through intelligence) the patrol teams' supervisor may direct patrolling to specific location in the reserve to deter or arrest poachers. There could also be what is termed as 'emergency' patrols, which are usually not planned patrols. The GRR operates from four patrol camps situated at vantage points on the perimeter of the reserve.

## Interviews

The conceptual framework designed for this study influenced interview questions development. The questions were developed based on Francis and Young (1992) cited in Scott and Pollock (2006), with a five-point Likert-Scale ranging from strongly disagree (ranked = 1) to strongly agree (ranked = 5). The neutral point was ranked = 3. The original Francis and Young (1992) questions were modified to suit the specific needs of this study. The survey questions were modified and adapted into five themes of seven questions each to reflect on the study's design. In all, 35 questions were asked under these themes: (1) interpersonal relationship, (2) intergroup relationship, (3) purpose, goals and roles, (4) skills and competencies and (5) learning and commitment. See Appendix A for details.

The law-enforcement officer of GRR who directly supervises the patrol teams on the field was asked to independently assess the four patrol teams with the interview questions. Again, the officer at GRR responsible for prosecuting cases at the court also assessed the teams' effectiveness on the same questions. The two officers' responses and observations were used to modify the questions before interviews were conducted.

Thirty-seven patrol team members from the four camps were interviewed. Participants were assured the study outcomes have no direct personal effect on their work or teams' compositions and structure. The assurance was to solicit openness from team members to collect data that truly reflect their teams' effectiveness.

Interview questions relating to team members' support, conflict resolution and mutual respect for each other were used to assess team members' interpersonal relationship (McEwan et al., 2017). Questions were asked to assess the intergroup relationship among the four patrol teams to understand collaboration in undertaking patrols (Leicht et al., 2007). Also, data were collected on patrol teams' clarity of roles, goals and purpose before patrols to reflect teams' preparation for patrols (Wiafe, 2017). Teams' skills and competencies data were taken to evaluate teams' execution of patrols (Jachmann, 2007). Learning goals and commitment were used to understand teams' reflections on patrol outcomes (Scott & Pollock, 2006).

## Desktop Study

Desktop study was conducted on a four-year patrol performance data of the GRR. This is the period where complete patrol data for the four camps were available. The data were analysed to determine the (1) number of patrols organised per month, (2) number of hours actively spent on patrols and (3) EPDs for each patrol team. Also, monthly recordings of (4) illegal activities detected and (5) sightings of medium-to-large mammals during patrols were counted for each patrol team. These indicators have been used to assess patrol team performance (Jachmann, 2007; Agro et al., 2017; Wiafe, 2017). An EPD was calculated from Effective Patrol Mandays (EPMDs) as described in Jachmann (2007).

# DATA ANALYSIS

Data were analysed with the help of the statistical software – Statistics Open for All (SOFA) (Self, 2017). Scores for each of the seven questions were added up to get a value for that theme for each team member. These were done for all the five themes and the scores were entered into the software. Scores were subjectively classified into low (scores < 25) and high (scores ≥ 25). The highest possible score for each theme was 35 and the lowest was to be seven. Results have been presented in tables and charts.

Box plots were used to present differences among the patrol teams for the number of patrols organised, number of hours spent actively patrolling and EPDs achieved. Kruskal-Wallis H test was used to determine the average differences among the patrol teams' effectiveness. Kruskal-Wallis H test was appropriate for the interview data scores which were subjectively ranked into an ordinal scale (Self, 2017). ANOVA tests were used to determine statistically significant average variations among the four patrol teams for the: (1) number of patrols organised, (2) number of hours actively spent on patrols, (3) EPDs achieved (4) illegal activities detected and (5) number of animals sighted.

# RESULTS

Thirty-seven patrol staff took part in the study and answered interview questions. Except Camp one which had 13 staff, all the other three camps had eight staff each who answered interview questions. Each camp had a mixture of junior and senior patrol staff whose work experiences ranged from seven to 30 years.

## Patrol Team Members Effectiveness Scores

Majority of team members scores were within the high classification range (scores ≥ 25) under all the five themes. The highest score for the low classification range was 50% and it was recorded under skills and competencies theme. This was scored by Camp two members. Generally, the level of all the four teams' scores were similar under each theme. However, Camp three score for the low classification was 0% under interpersonal relationship and under learning and commitment themes. Also, Camp four scored 100% for team purpose, goals and roles for the high classification range.

Patrol team members' scores under the five themes: (1) interpersonal relationships, (2) intergroup relationship, (3) team purpose, goals and roles, (4) team skills and competencies and (5) team learning and commitment have been presented in Table 1 in percentages.

**Table 1: Percentage Scores of Patrol Teams**

| | Interpersonal Relationship (%) | | Intergroup Relationship (%) | | Learning and Commitment (%) | | Purpose, Goals and Roles (%) | | Skills and Competencies (%) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Low | High | Low | High | Low | High | Low | High | Low | High |
| Camp 1 | 15.40 | 84.60 | 23.10 | 76.90 | 7.70 | 92.30 | 7.70 | 92.30 | 46.20 | 53.80 |
| Camp 2 | 12.50 | 87.50 | 25.00 | 75.00 | 12.50 | 87.50 | 37.50 | 62.50 | 50.00 | 50.00 |
| Camp 3 | 0.00 | 100.00 | 22.00 | 78.00 | 0.00 | 100.00 | 15.50 | 84.50 | 14.50 | 85.50 |
| Camp 4 | 37.50 | 62.50 | 25.00 | 75.00 | 12.50 | 87.50 | 0.00 | 100.00 | 12.50 | 87.50 |

## Patrol Teams' Number of Patrols Organised, Hours Spent and EPDs Achieved

Number of patrols organised per month, number of hours actively spent on patrols per month and the EPDs were calculated for each team. Comparisons of 48 months recordings among the patrol teams are presented in this section with boxplots charts.

## Number of Patrols Organised

Fig. 2 is a presentation of the number of patrols organised in the four camps for the period. Camp two and Camp

three did not have variability in their figures; hence, their plots did not display in the chart. The maximum number of patrols organised in a month for Camp one was 22 and that for Camp four was 19. The minimum number of organised patrols, respectively, for both camps were 11 and eight and their median values were 15.5 and 14.5.

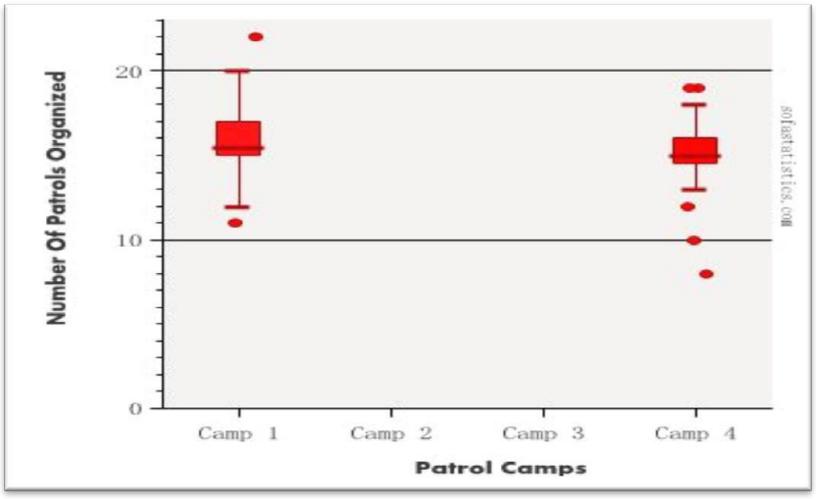



**Fig. 2: Number of Patrols Organised in the Four Teams**

## Number of Hours Actively Patrolled

Fig. 3 shows the number of hours actively spent on patrols among the four camps. Rest times on patrols were deducted from the period between start and end of each patrol.

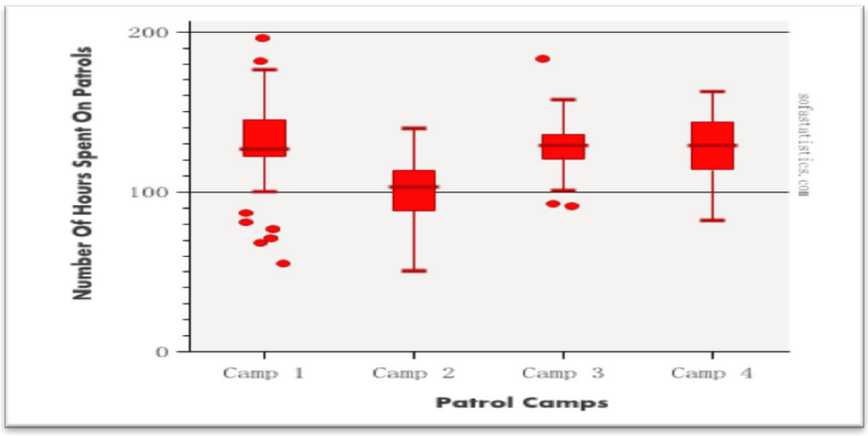



**Fig. 3: Number of Hours Actively Spent on Patrols Among the Four Teams**

The monthly median values for the number of hours actively spent on patrols for the teams were Camp 1 = 127.20, Camp 2 = 103.51, Camp 3 = 129.15 and Camp 4 = 129.47. Camp two spent the lowest number of hours on patrols. However, the rest of the camps' averages were above 120 hours/month. A team with a higher than 120 hours per month achievement was translated into an EPD that is above the Ghana national minimum standard as seen in the next section. Camp one and Camp three recorded outliers in the number of hours spent actively patrolling, but outputs of Camp two and Camp four were more consistent with their teams.

## EPDs Achieved Among Patrol Camps

Fig. 4 shows EPDs achieved for the four teams. Consistent with the number of hours actively spent on patrols, Camp

two had the least median value of 12.97 whereas the other three camps had median values that were above 16. However, there was less variability in Camp three EPD than the rest of the teams although the camp recorded outliers.

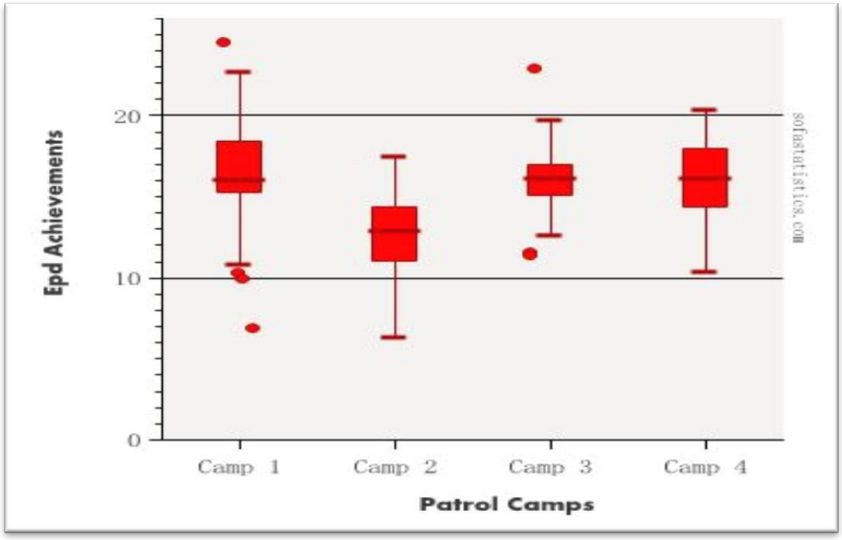



**Fig. 4: EPDs Achieved Among Patrol Camps**

## Interpersonal and Intergroup Relationships Effect on Team Effectiveness

A Kruskal-Wallis H test average was conducted to determine statistically significant differences among the four teams' interpersonal and intergroup relationships on the teams' effectiveness scores for groups of low and high. The test was to see how individual team members' values, interests and preferences affect teams' effectiveness. Average interpersonal and intergroup relationships differences among the teams with (1) team purpose, goals and roles, (2) team skills and competencies and (3) team learning and commitment are shown in Table 2. There were no statistically significant differences among the four teams scores determined at 5%.

**Table 2: Kruskal-Wallis H Test for Interpersonal and Intergroup Relationships versus Team Effectiveness Scores for Groups of 'Low' and 'High'**

| | Team Purpose, Goals and Roles | | Team Skills and Competencies | | Team Learning and Commitment | |
|---|---|---|---|---|---|---|
| | P Value | H Statistics | P Value | H Statistics | P value | H Statistics |
| Interpersonal relationship | 0.2554 | 1.293 | 0.7570 | 0.096 | 0.0694 | 3.296 |
| Intergroup relationship | 0.6716 | 0.18 | 0.3701 | 0.803 | 0.3279 | 0.957 |

N = 37, Df = 1

The results indicate that team membership and composition have no effect in organising, undertaking and reflecting on patrol performances at the camps. The findings are that individual team members' values, interests and preferences do not affect teams' (1) preparation before patrols, (2) patrol execution on the field and (3) reflections after patrols.

## Patrol Teams' Differences and Performance

An ANOVA test was used to analyse the statistically significant differences among the four patrol camps in the number of hours spent on patrols, the number of patrols organised and EPD achieved per month. The test was also applied to determine the statistical variations among the patrol camps in the number of illegal activities detected and number of animals sighted.

There was no statistically significant difference in average number of patrols organised among the four patrol camps (*p value* = 0.1810). However, there were statistically significant differences among the other four tests that were conducted. Table 3 shows the results of the ANOVA tests that were conducted.

**Table 3: ANOVA for Patrol Team Performances**

| Test Description | Source | Sum of Squares | Df | Mean Sum of Squares | F | P Value |
|---|---|---|---|---|---|---|
| Average number of patrols organised for patrol camps groups from "Camp 1" to "Camp 4" | Between | 16.141 | | | | |
| | Within | 615.729 | | | | |
| Average number of hours spent on patrols for patrol camps groups from "Camp 1" to "Camp 4" | Between | 24575.286 | 3 | 8191.762 | 19.040 | 7.965e-11 |
| | Within | 80886.557 | 188 | 430.248 | - | - |
| Average EPDs achieved for patrol camps groups from "Camp 1" to "Camp 4" | Between | 388.676 | 3 | 129.559 | 19.884 | 3.080e-11 |
| | Within | 1224.974 | 188 | 6.516 | - | - |
| Average number of animals sighted for patrol camps groups from "Camp 1" to "Camp 4" | Between | 95280.500 | 3 | 31760.167 | 24.598 | 1.796e-13 |
| | Within | 242743.417 | 188 | 1291.188 | - | - |
| Average illegal activities detected for patrol camps groups from "Camp 1" to "Camp 4" | Between | 81.521 | 3 | 27.174 | 4.344 | 5.499e-3 |
| | Within | 1175.958 | 188 | 6.255 | - | - |

# DISCUSSIONS

This study was conceptualised on protected area patrol teams' members interpersonal and intergroup relationships perspectives on (1) team purpose, goals and roles, (2) team skills and competencies and (3) team commitment and learning (Paolucci et al., 2018). Performance indicators used in this study were number of patrols organised, hours actively spent on patrols and EPDs achieved for the patrol teams (Agro et al., 2017; Kablan et al., 2017; Wiafe, 2017). The study also determined patrol performances in the number of animals sighted and illegal activities detected among the patrol teams for a 48-month period.

## Team Members' Effectiveness Scores: Implications for Cohesion and Patrols

Team members' scores for their team effectiveness were similar within the subjectively high scores' classification. The high scores in interpersonal and intergroup relationships indicate team members assessed their teams to be cohesive. This fits into Bell et al. (2018) stated affective and emotive tendencies for team members, which are seen in members' feelings and attitudes towards their team and its tasks. The affective and emotive tendencies generate team cohesion, trust, emotion and mood together with efficacy and sometimes conflict among team members.

The high-level effectiveness scores for all the four teams could be attributed to the nature of the composition of the team members made up of different levels of work experiences. The nature of the teams' composition had created homogeneity in each team with diverse work experiences, which reflected in the effectiveness scores. This is in agreement with Byrne (1961) cited in Bell et al. (2018) assertion that homogeneous team members trade-off individual preferences to attract each other to promote cooperation. This is positive for organising effective patrols in the teams.

However, the high scores for interpersonal relationship could have negative consequences for effective law enforcement. National Science Council (2015) stated that subgroup members' selflessness and cohesion can sometimes be harmful, because it can limit intergroup relationships. On the contrary, intergroup dependency is required for effective law enforcement in protected areas to reduce poaching of biodiversity resources (Galvin et al., 2009; Shafer, 2015). However, in this study there were also high scores for intergroup relationships among the patrol teams, which is a positive indication for effective collaboration among the teams in undertaking patrols. The high scores for intergroup relationship mean group members comradery transcends beyond their immediate group to other members in different teams.

Mendonça et al. (2014) and Paolucci et al. (2018) stated high team turnover together with short working history can negatively affect teams' performance. However, law-enforcement organisations need some level of staff attrition especially in a society such as the study area where cultural and clan bonds can adversely affect effectiveness (Frick & Rose, 2017).

## Effectiveness and Number of Patrols Organised, Hours Spent and EPDs Achieved

Team composition is said to be both a threat and potential to organisational performance (Mendonça et al., 2014). Although the level of the four teams' effectiveness scores appeared to be similar, there were marked differences in patrol activities. Our findings showed that teams that scored high in skills and competencies stayed longer on patrols to achieve higher EPDs. This fits into Frankfurt Zoological Society (2014) report that stated team skills, knowledge and competencies are important factors for effective law enforcement in protected areas.

However, in this study it was not only scoring higher in team skills and competencies that was found to be important for patrols execution, but also understanding the clarity of purpose, goals and roles of team members. Camp four that scored the highest under both was the best team performer by staying longest on patrols with a resultant highest EPD median value. These findings indicate patrol preparation is as important as its actual execution on the field.

## Interpersonal and Intergroup Relationships Effect on Team Effectiveness

The patrol teams' activities were largely shaped up by organisational culture that demands certain law-enforcement standards are adhered to (The Wildlife Division, 2009). For example, the capping of an acceptable EPD/staff/month at 15 led the teams to organise number of patrols which median values were just within the national minimum standard (Jachmann, 2007). Individual team member's preferences, interests and values were subsumed by team goals. McEwan et al. (2017) made similar findings where team tasks overrode individual preferences. Also, the results were synonymous with an interdependency phenomenon, which develops among team members over time (Bell et al., 2018). This has the tendency to limit individual initiatives as the collective whole of the team supersedes those of individual members.

The Kruskal–Wallis H test results showed there were no statistically significant differences in team members' composition and its effect on (1) team purpose, goals and roles, (2) team skills and competencies and (3) team learning and commitment. This means individual team members' perspectives did not differ in the processes of organising, executing and reflecting on patrol outcomes. The results contrasted what Keus (2002) reported about individual's performance flow effects on team's effectiveness and organisational performance. Rather, the findings reflected stable teams whose performances were largely shaped by organisational processes with exogenous decision makers as reported by Mendonça et al. (2014). For example, team members are restricted not to undertake patrols alone (The Wildlife Division, 2009).

## Patrol Teams' Performance Differences and Law Enforcement

There was no statistically significant difference in the average number of patrols organised among the four patrol camps ($p$ *value* = 0.1810). Although the number of patrols organised among the teams statistically did not vary, the number of hours spent on patrols and its derivative EPDs were statistically different among the teams in the ANOVA tests. The variation would have been caused by the level of affective and emotive commitments of team members to their various teams (Bell et al., 2018; Paolucci et al., 2018). Team members aligned their individual set of goals to their team tasks which impacted on the overall performance in the number of hours actively spent on patrols and EPDs achieved (Keus, 2002).

Effective law enforcement in protected areas is important to prevent illegal use of biodiversity resources (Galvin et al., 2009; Shafer, 2015). Patrol teams' skills, knowledge, competencies and experiences together with sufficient provision of equipment as well as motivated conditions of service are important factors in combating biodiversity crimes (Frankfurt Zoological Society, 2014). In this study, there was no statistically significant differences among the team members' interpersonal and intergroup relationship with their teams' effectiveness. This suggests the statistically significant differences among the four teams in the number of animals sighted and illegal activities detected in the ANOVA tests could be attributed to ecological conditions rather than the differences in the teams' levels of effectiveness. Law-enforcement strategies should then concentrate patrol efforts in locations with high animal populations.

There is a relationship between the number of animals sighted and illegal activities detected on patrols. For example, Kablan et al. (2017) found that increasing patrol activities led to increasing sightings of animals with reduced illegal activities. In this study, a Pearson correlation test to determine the relationship between number of animals sighted and illegal activities detected showed that there was a weak positive correlation between the two variables and the relationship was statistically significant at 5% ($P$ *value* = 0.01153, $R$ = 0.182, $Df$ = 190). Locations with high animal concentrations attract poachers and patrol teams equally. Increasing patrol activities in those locations lead to initial detection of high number of illegal activities to a point before poaching activities start to decline (Plumptre et al., 2014).

# CONCLUSIONS

This study was set to assess team members' values', preferences' and interests' effect on patrol team effectiveness and its resultant performance. Four patrol teams from the Gbele Resource Reserve in Northern Ghana were interviewed for this objective. The findings were that team members assessed their teams with high scores for interpersonal and intergroup relationships. The high interpersonal relationships scores indicate cohesion, trust, emotion and mood as well as efficacy existed among team members.

The findings also showed that the four patrol teams showed differences in team performances in the number of patrols organised, number of hours spent on patrols and its resultant EPDs achieved. Teams that scored highest in team purpose, goals and roles and team skills and competencies also spent much time on patrols with higher EPDs. This means patrol

teams need to prepare well before undertaking patrols irrespective of their level of skills and competencies.

The findings again indicate there were no statistically significant variations among the four teams' interpersonal and intergroup relationship versus (1) team purpose, goals and roles, (2) team skills and competencies and (3) team learning and reflections in a Kruskal-Wallis H test. However, there were statistically significant differences among the teams in their performances from the ANOVA tests except in the number of patrols organised. The differences among the four teams in the number of animals sighted and illegal activities detected were due to ecological conditions rather than differences in the teams' effectiveness scores.

This study took place in a relatively small protected area with small number of patrol teams. The research should be replicated in a larger protected area with similar settings for further empirical evidences to support the findings of this study.

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# APPENDIX A

## Interview Questions

Please assess your patrol team effectiveness in law enforcement activities. Indicate your level of agreement to the statements by ticking the appropriate box.

| Strongly Disagree = 1 | Disagree = 2 | Neutral = 3 | Agree = 4 | Strongly Agree = 5 |
|---|---|---|---|---|

Name of Camp……. Respondents Code…….

| Sr. No. | Team Members Interpersonal Relationships | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 1 | Team members appreciate one another's unique capabilities. | | | | | |
| 2 | We address and resolve issues quickly. | | | | | |
| 3 | Communication in our group is open and honest. | | | | | |
| 4 | Members of our team trust each other. | | | | | |
| 5 | Team members help one another deal with problems or resolve issues. | | | | | |
| 6 | We resolve our differences without damaging relationships. | | | | | |
| 7 | Team members display high levels of cooperation and mutual support. Interrelationship among different camps | | | | | |
| 8 | We are able to resolve conflicts with other patrol camps collaboratively. | | | | | |
| 9 | We prioritise our patrols to complement the efforts of other camps. | | | | | |
| 10 | We communicate effectively with other camps on illegal activities. | | | | | |
| 11 | Our team trusts in the competencies of the other patrol teams. | | | | | |
| 12 | We consult the other camps to integrate our patrols with theirs. | | | | | |
| 13 | We enjoy undertaken combine patrols with teams from the other camps. | | | | | |
| 14 | Our law enforcement officer coordinates all teams' activities effectively. Team Purpose, Goals and Roles | | | | | |
| 15 | Our team has a meaningful, shared purpose of combating poaching. | | | | | |
| 16 | We meet to set challenging goals to execute patrol preparations. | | | | | |
| 17 | We make sure our patrols reduce incidence of poaching in our range. | | | | | |
| 18 | I clearly understand my roles before patrols. | | | | | |
| 19 | Each team member understands others roles before we undertake patrols. | | | | | |
| 20 | Everyone values what each member's role contributes to the team. | | | | | |
| 21 | We understand shared tasks without problems before patrols. Team Skills and Competencies | | | | | |
| 22 | Poaching will reduce if team members improve skills during patrols. | | | | | |
| 23 | Our team is able to undertake long distance patrols for long time. | | | | | |
| 24 | Our mix skills match for effective patrols to reduce poaching. | | | | | |
| 25 | We need new training to enable us undertake effective patrols. | | | | | |
| 26 | We know what to do when we detect illegal activities on the field. | | | | | |
| 27 | We understand what to do immediately a poacher is arrested. | | | | | |
| 28 | We know how to secure our safety and that of the poacher on the field. Team Learning and Commitment | | | | | |
| 29 | Our team composition inspires me to do more to reduce poaching. | | | | | |
| 30 | All my patrol team members are proud to be part of the team. | | | | | |
| 31 | Our team is excited about our contribution to reducing poaching. | | | | | |
| 32 | We welcome new ideas that improve our anti-poaching skills. | | | | | |
| 33 | We always reflect on each patrol to improve on our performance. | | | | | |
| 34 | We always work to improve our response to every patrol situation. | | | | | |
| 35 | We view all patrol situations as opportunities for learning and growth. | | | | | |