Incident Command System Implementation in Ghana: A Case Study of Sunyani Municipality

Benjamin Osafo Carlis-Paittoo and Gambrah, E.

Department of Environmental Management, School of Natural Resources, University of Energy and Natural Resources, Sunyani Ghana. yookwesi2005@yahoo.com

Abstract

The Incident Command System (ICS) is a standardized, on-scene, all-risk incident management approach, which has been globally accepted as a proactive measure for rapid response to all forms of natural and man-made disasters, with a great level of success. It coordinates all the agencies responsible for disaster management of the nation which include: Ghana National Fire Service (GNFS), National Disaster Management Organization (NADMO), Ghana Ambulance Service (GAS), the Police Service, Ghana Armed Forces, etc. This study was conducted to assess ICS implementation in Ghana among key emergency management agencies in the Sunyani Municipality. The study was based on three core variables which included: status of the ICS in disaster management, challenges and issues associated with the implementation of ICS, and the capabilities of emergency responders. This study employed a survey study design with a sample size of 80. Stratified sampling technique was applied. Questionnaires were administered as the main data collection instrument. Data was analyzed using Statistical Package for Social Sciences (SPSS) version 23.0. The study revealed that the major challenges that militate against the effective functioning of ICS include limited ICS training, inadequate staff specialization, lack of succession planning, inadequate funding, poor logistical support, inappropriate structures to fully support ICS implementation, absence of collaboration among key agencies, and inadequate law enforcement processes. The study recommended a thorough review the existing policy framework on the Incident Command System and emergency management in Ghana.

Keywords – ***Incident command system; emergency response; training and development; disaster management; standard operating procedures.***

Introduction

The Incident Command System (ICS) is a standardized approach to the command, control, and coordination of emergency response providing a common hierarchy within which responders from multiple representations can be effectual. ICS was initially developed to address problems of inter-agency responses to wildfires in California and Arizona, but is now a component of the National Incident Management System (NIMS) in the US, where it has evolved into use in All-Hazards situations, ranging from active shootings to HazMat scenes. In addition, ICS has acted as a blueprint for similar approaches internationally.

The Incident Command System comprised five major functional areas: command, operations, planning, logistics, and finance/administration. As shown in Figure 1 ICS is built around five critical components with someone identified as the lead for each

component (Herrmann, 2007), whilst highlighting liaison between and among the components. Therefore, the field response level is usually structured to facilitate natural processes in five major operational areas: command, operations, planning, logistics, and finance &administration (FEMA, 2011). The command function is directed by the Incident Commander in charge of the incident. When expansion is required, the Incident Commander establishes other Command Staff positions and examples include: information officer, who coordinates the release of information to the media; safety officer, who monitors safety conditions and develops standards for ensuring the safety of all designated personnel; and the liaison officer who acts as the on-scene contact for other agencies assigned to the incident. The Incident Commander activates additional general staff sections as necessary. This includes the planning, operations, logistics, and finance & administration sections. The institution of these ensures resource utilization, efficient preparation of facilities, services, and materials; and tracking incident costs (Federal Emergency Management Agency, FEMA, 2008).

The Incident Command System (ICS) is, however, contrived to enable effective and efficient domestic incident management by integrating a combination of facilities, equipment, personnel, operations, and communications operating within a common organizational structure. A well-structured ICS attest to the following principles: principle of non-duplication and overlapping of roles and responsibilities; principle of clear definition of responsibilities and roles (job description), and principle of job title derived from job function. Before the ICS was created, one of the problems with responding to wildfires was unclear designation of authority (Molino, 2006). Practitioners indicated that determining an Incident Commander (IC) for all disaster response-relevant departments were difficult (Grainer, 2016; Moynihan, 2009).The Incident Command System, worldwide, continue to face challenges including managerial and tactical competencies, lack of effective reporting and communication lines, and interagency coordination, among others.

Research Objectives

The primary aim of the work evolved around three core variables, which included: status of the ICS in emergency management situations, challenges associated with implementation of ICS in major disaster preparedness, response and recovery, and, of course, the knowledge-based competencies of emergency responders in the Sunyani Municipality and in Ghana, as a whole.

This has, thus, created a gap in literature concerning the execution and operation of ICS in Ghana. This researched seeks to determine the need for an intensive examination of implementation of the Incident Command System in order to come out with most appropriate strategies to fill the gaps and deficiencies that are associated with effective deployment of ICS in Ghana.

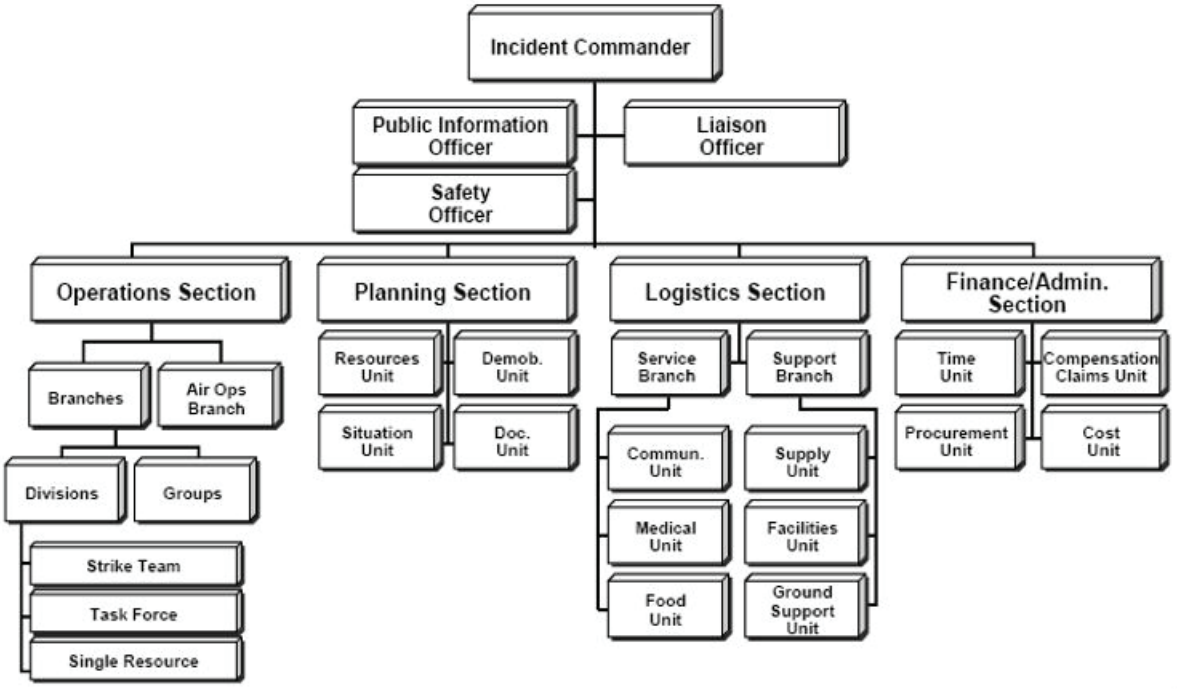

Figure 1 Incident Command Structure and Hierarchy.

Source: Federal Emergency Management Agency, 2011

A series of natural and man-made disasters of all forms precipitate the urgent need of government to establish a comprehensive ICS policy in the country. Examples of incidents include, but not restricted to, the following; fire, both structural and wildfire, hazardous material situations, hunt and rescue, oil spill, pest eradication, control of animal diseases, planned events, such as parades or political rallies, just to mention a few. Katey (2012) remarked that, the Ghana National Disaster Management Organization (NADMO) recorded 243,988 natural disasters which resulted in 14 deaths in 2011. The disasters were mainly floods, rainstorms and wind storms. On July 10, 2017, the Greater – Accra, Central, Western and Eastern regions were declared as flood-prone emergencies and/or under threat of floods with potential to cause devastation (Herrmann, 2007).

Materials and Methods

Study Area

The study was conducted in the Sunyani Municipality to serve as a representation of a national command system (see Figure 2). It forms one of the twenty-seven districts in the Brong – Ahafo Region. The Sunyani Municipality lies within the Wet Semi-Equatorial Climatic Zone of Ghana. The population of Sunyani Municipality, with reference to the 2010 Population and Housing Census conducted, was 123, 224 (Ghana Statistical Service, 2010).

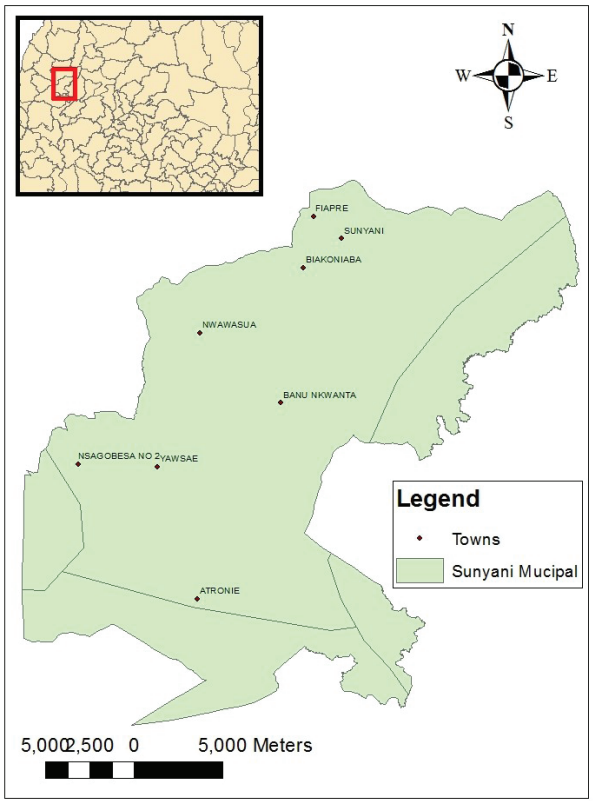

Figure 2: Map of the Study Area

Study Population and Sample

The survey was conducted among personnel representing the emergency management agencies and organizations (Ghana National Fire Service, National Disaster Management Organization, National Ambulance Service and Ghana Police Service within the Sunyani Municipality.

Table 1 indicates the total number of men and women in each of the security agencies in the municipality.

Table 1: Sex distribution of security personnel in Sunyani Municipality

Agency	**Male**	**Female**	**Total**
NADMO	13	14	27
FIRE SERVICE	44	16	60
AMBULANCE SERVICE	15	5	20
POLICE	71	114	185
Overall Total	292		

The sample size was determined using the mathematical formula: n= N / 1+N (e)2 (Gomez and Jones, 2010), where n is the sample size, N is the population size and e is the margin of error. With 10% margin of error, the minimum sample size was determined to be 75. However, a sample size of 80 respondents was finally selected to take care of possible non respondents. A stratified random sampling technique was then used to select respondents

from the various agencies using the proportional allocation method.

Data Collection: Questionnaire-based interview

Questionnaires – based interview was used to elicit information between 13th to 28th February, 2018. Primarily, both close-ended and open-ended questions were verbally read to randomly choose the emergency respondents. Overall, the data collected was quantitative in relation to the core objectives of the study: present status of ICS, perception of knowledge, training and maturation.

Data Analysis

Responses from interviews were coded using the IBM, Statistical Package for Social Scientist (SPSS) computer software version 20.0. (2012) and analyzed for trends in response to research questions. Data was processed and relevant tables and graphs produced.

Results and Discussion

Status of the ICS Implementation in the Sunyani Municipality

The stage of adoption of the ICS as shown in (Table 2) indicates that majority (58.8%) of the respondents affirmed that the ICS was at the operational stage. A total of 27 representing 33.8% stated that it is at the planning stage while just 2.4% stated that it is at the evaluation stage. This implies that there has been some progress in the implementation of ICS as compared to the status of ICS in 2010 where NADMO (2010) reported that the implementation and used of ICS in Ghana is unknown. However, from Table 3 majority [52 (65%)] of the informants also indicated that the facilities to support the effective operation of the ICS were inadequate.These findings implied that there are inadequate facilities and structures to support the functioning of ICS in the various disaster management organizations in the Sunyani Municipality.

Table 2: Stage of Adoption of ICS by Individual Disaster Management Organisations

Stage of ICS Adoption	**Name of institution**	**Total**			
	GNFS	**GAS**	**GPS**	**NADMO**	**N (%)**
Planning Stage	8(40.0)	3(15.0)	10(50.0)	6(30.0)	27(33.8)
Implementation Stage	2(10.0)	0(0.0)	0(0.0)	2(10.0)	4(5.0)
Operational Stage	10(50.0)	17(85.0)	8(40.0)	12(60.0)	47(58.8)
Evaluation stage	0(0.0)	0(0.0)	2(10.0)	0(0.0)	2(2.4)
Total	20(100.0)	20(100.0)	20(100.0)	20(100.0)	80(100.0)

Source: Field Survey, 2018

Table 3: Availability of Facilities and Structures to Support the Functioning of ICS in Disaster Management

Response	**Name of institution**	**Total**			

	GNFS	GAS	GPS	NADMO	
	n (%)	n (%)	n (%)	n (%)	
Adequate	5(25.0)	11(55.0)	7(35.0)	2(10.0)	25(31.3)
Inadequate	15(75.0)	9(45.0)	11(55.0)	17(85.0)	52(65.0)
Not at all	0(0.0)	0(0.0)	2(10.0)	1(5.0)	3(3.8)
Total	20(100.0)	20(100.0)	20(100.0)	20(100.0)	80(100.0)

Source: Field Survey, 2018

Challenges

Challenges hindering the effective implementation of ICS in the Sunyani Municipality are presented in Table 4. The major challenges indicated the respondent were: limited ICS training for sufficient numbers of personnel 55(68.8%), inadequate staff specialization in ICS 42(52.5%, lack of succession planning for ICS 56(70%), inadequate funding for ICS 63(78.8%), lack of logistics 57(71.3%), inadequate structures to fully support ICS 45(56.3%), poor collaboration among disaster management agencies 43(53.8%), and inadequate law enforcement 47(58.8%). However, some of the factors that serves as minor challenges to the implementation and application of ICS in disaster management includes: atrophy of knowledge, skills, and abilities of staff 43(53.7%), high demand associated with ICS 42(52.5%), and ongoing distrust for ICS 50(62.5%). According to Grainer (2016), although the basic Incident Command System (ICS) is taught across emergency response disciplines, several shortcomings and constraints could lead to its downfall in its implementation and operation in many countries. Other challenges include the following: lack of awareness creation, communication, long-term plan, regulation to support the ICS, supervision, political interference by opinion leaders, poor command structure at incidence grounds, etc.

Table 4: Challenges Impeding the Implementation and Application of ICS

Barrier	**Major**	**Minor**	**Not a Barrier**			
	Freq.	**%**	**Freq.**	**%**	**Freq.**	**%**
Limited ICS training for sufficient numbers of personnel	55	68.8	25	31.3	0	0.00
Inadequate staff specialization in ICS	42	52.5	32	40.0	6	7.5
Atrophy of knowledge, skills, and abilities of staff	37	46.3	36	45.0	7	8.8
High demand associated with ICS	38	47.5	33	41.3	9	11.3
Lack of succession planning for ICS	56	70.0	21	26.3	3	3.8
Inadequate funding for ICS	63	78.8	15	18.8	2	2.5
Lack of logistics	57	71.3	20	25.0	3	3.8
Inadequate structures to fully support ICS	45	56.3	29	36.3	6	7.5
Poor collaboration among disaster management agencies	43	53.8	31	38.8	6	7.5

Ongoing distrust for ICS	30	37.5	41	51.3	9	11.3
Inadequate Law Enforcement	47	58.8	27	33.8	6	7.5

Source: Field Survey, 2018

Knowledge-based competencies of Emergency Responders in the Use of ICS in Disaster Management

Table 5 represents the knowledge of respondents on the core principles of ICS. The results indicate that high number of the respondents had average knowledge on; common terminology (40%), a modular organization (42.5%), integrated communications (35%), a manageable span of control (36.3%), and designated incident facilities (36.3%). Again, high number of the respondents had low knowledge on; a unified command structure 29(36.3%), consolidated IAPs 30(37.5%), and comprehensive resource management 32(40%). However, high number of the respondents had high knowledge on unity of command 29(36.3%).

These findings imply that majority of the staff of the various disaster management organizations in the Sunyani Municipality lack appreciable knowledge on the major principles of the ICS. According to Russell (2011), ICS terminology is standard and consistent among all agencies involved and all staff must have adequate understanding of the core principles. This is probably attributed to inadequate training and education of the staff of the various organizations on ICS as revealed in the study Figure 3. The findings also indicate that there was no significant ($p>0.5$) relationship between knowledge of ICS use and demographic characteristics such as sex ($p=0.348$) and age ($p=0.311$) with probability value (p-value) greater than the alpha value (0.05). However, there was a significant ($p<0.05$) relationship between knowledge of ICS use and the educational qualification ($p=0.028$) of respondents with a probability value less than the alpha value (0.05) as indicated in Table 6 respondents with a probability value less than the alpha value (0.05).

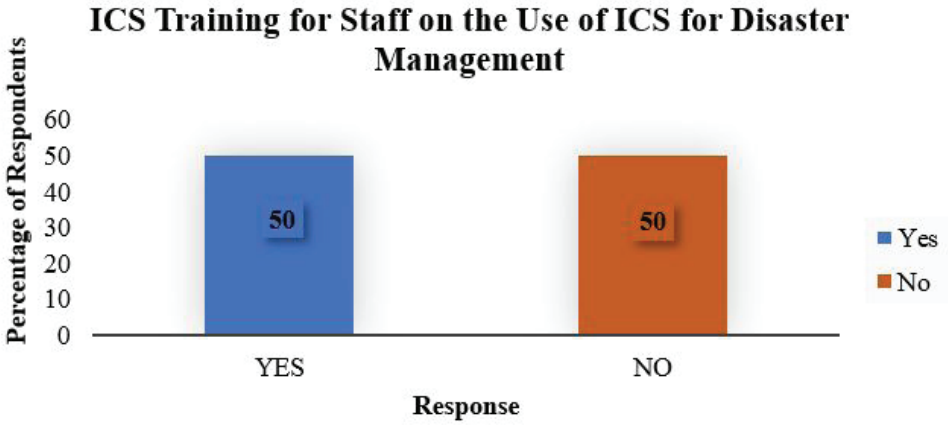

Figure 3: Training and development for Staff on the use of ICS for Disaster Management

Source: Field Survey, 2018

Table 6: Relationship between Demographic Data and Knowledge of use of ICS

Variable	**Response**	**Level of Knowledge on ICS**					

		Very high extent	**High extent**	**Small extent**	**Very small extent**	**Total**	**P-value**
		n (%)	n (%)	n (%)	n (%)	n (%)	
Sex	Male	11(22.9)	16(33.3)	18(37.5)	3(6.3)	48(100)	0.348
	Female	4(12.5)	13(40.6)	13(40.6)	2(6.3)	32(100)	
	Total	15(18.8)	29(36.3)	31(38.8)	5(6.3)	80(100)	
Age (years)	21-30 yrs.	4(12.1)	14(42.4)	13(39.4)	2(6.1)	33(100)	0.311
	31-40 yrs.	9(27.3)	8(24.2)	14(42.4)	2(6.1)	33(100)	
	41-50 yrs.	2(20.0)	4(40.0)	3(30.0)	1(10.0)	10(100)	
	≥51 yrs.	0(0.0)	3(75.0)	1(25.0)	0(0.0)	4(100)	
	Total	15(18.8)	29(36.3)	31(38.8)	5(6.3)	80(100)	
Educational Qualification	SHS	9(25.0)	8(22.2)	16(44.4)	3(8.3)	36(100)	0.028
	Tertiary	6(13.6)	21(47.7)	15(34.1)	2(4.5)	44(100)	
	Total	15(18.8)	29(36.3)	31(38.8)	5(6.3)	80(100)	

Source: Field Survey, 2018

Table 5: Knowledge of Staff on ICS Principles

Principle	Level of Familiarity							
	High	Average	Low	Not at all				
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Common terminology	25	31.3	32	40.0	17	21.3	6	7.5
A modular organization	14	17.5	34	42.5	25	31.3	7	8.8
Integrated communications	23	28.8	28	35.0	25	31.3	4	5.0
Unity of command	29	36.3	23	28.8	24	30.0	4	5.0
A unified command structure	16	20.0	28	35.0	29	36.3	7	8.8
Consolidated IAPs	8	10.0	27	33.8	30	37.5	15	18.8
A manageable span of control	18	22.5	29	36.3	20	25.0	13	16.3
Designated incident facilities	12	15.0	29	36.3	25	31.3	14	17.5
Comprehensive resource management	17	21.3	21	26.3	32	40.0	10	12.5

Source: Field Survey, 2018

Conclusion and Recommendations

The study found that the implementation of ICS in Ghana requires a comprehensive policy direction with the view to provide adequate resources to achieve sustainable goals,

objectives and targets, and a recognized national standard operating procedures. In view of this, will demand legislative instrument to buttress stated policies and programs to support the following key strategic focus: improved human resource capabilities; adequate logistical support and facilities management; political interventions of governments; bridging of the academia and state institutions; national agenda towards re-definition of concepts, principles and norms associated with teamwork and collaboration among key parties and emergency responders.

References

Report

Federal Emergency Management Agency, (2008). National Incident Management System. Washington DC: FEMA Publications.

Federal Emergency Management Agency, (2011). National Disaster Recovery Framework. Strengthening Disaster Recovery for the Nation. Washington DC: FEMA Publications.

Herrmann, J. (2007). Incident Command System (ICS). New York: Disaster Interfaith Services

(NYDIS). Hoboken, NJ. IBM Center for the Business of Government, Washington DC, USA.IFRC, 2017

NADMO, (2010). National Disaster Management Organization www.unisdr.org/.../Ghana-report-establishment-national-platform.doc.Accessed 30.04.10

Books

Gomez, B. and Jones, P.J. (2010). Research methods in Geography. John Wiley & Sons Ltd.

Molino, L. (2006). Emergency Incident Management Systems, John Wiley & Sons, Inc.,

Morgan, G. (1986). Images of Organization. California: Sage Publications.

Moynihan, D. (2005). Leveraging Collaborative Networks in Infrequent Emergency Situations,

Journal Articles

Moynihan, D. (2009). The Network Governance of Crisis Response: Case Studies of Incident Command Systems. Journal of Public Administration Research and Theory, 19, 895-915.

Online Documents

Grainer, S. (2016). Incident Command System: Perishable if not practiced. Retrieved October 28, 2017 from https://www.domesticpreparedness.com/preparedness/

incident-command-system-perishable-if-not-practiced/Haddow et al., 2011

Katey, D. (2012). Ghana records over 243,000 natural disasters in 2011. Retrieved October 28, 2017 from https://www.ghanabusinessnews.com/2012/06/16/ghana-records-over-243000-natural-disasters-in-2011/.