ENHANCING THE EFFECTIVENESS OF DISASTER PREPAREDNESS EXERCISES: THE 'FAIM' EXERCISE EVALUATION FRAMEWORK

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ABSTRACT

This paper introduces a structured framework as a good practice for the Evaluation of Disaster Management Preparedness Exercises. The FAIM Exercise Evaluation Framework directly addresses the areas of improvement in the practical implementation of the exercise evaluation process, as these have been documented by civil protection practitioners and by researchers in the domain of Disaster Management. An outline of the FAIM framework is provided, detailing the activities which are foreseen to be performed, as well as the innovations introduced in relation to current practices. Finally, the validation of the FAIM framework in multiple disaster preparedness exercises is discussed.

Keywords: Disaster Management, Preparedness Exercises, Evaluation Framework.

1. INTRODUCTION

Preparedness Exercises constitute one of the most challenging aspects of the disaster preparedness training activities [1]. Testing real-life disaster response plans is a complex and costly activity which cannot be frequently performed and cannot be easily simulated to reflect the realities of a disaster response operation. However, exercising is the only tool through which civil protection authorities can test the validity of their disaster response plans and increase their accountability [2]. It is therefore critical for the civil protection authorities to employ a robust **Exercise Evaluation Process** through which the preparedness capacity can be objectively assessed. The exercise evaluation process provides the basis for objectively documenting the **lessons learnt** of the exercise implementation and for developing a **way-forward plan** in order to improve the response capacity of a civil protection authority. The significance of the exercise evaluation process has been recognised and addressed in the activities of national civil protection authorities, with the US Homeland Security Exercise & Evaluation Program (HSEEP) [3] being a prime example. In addition, a limited number of research studies have investigated the structure and efficiency of exercise evaluation activities in Disaster Management (see [2] for a comprehensive overview of these works). The **findings** of these studies, as well as the **comprehensive empirical knowledge** of the paper's author who has served as **Head Evaluator** in multiple Full-Scale Preparedness Exercises, suggest that there are **notable Areas of Improvement (AoI)** in the implementation and the effectiveness of evaluation activities. In particular there is **a lack of the methodological robustness** in the following areas of the exercise evaluation process:

- **AoI1. The interface between exercise design and exercise evaluation**
- **AoI2. The elicitation of evaluation information**
- **AoI3. The analysis of evaluation information**
- **AoI4. The interface between exercise evaluation and the way-forward process**

The aim of this paper is to introduce the **FAIM (FAcilitate – IMprovement) Exercise Evaluation Framework**. FAIM is an **open exercise evaluation framework** which directly addresses the notable areas

of improvement in the implementation of an exercise evaluation process. The framework has been prototyped by the paper's author based on all currently available **scientific information** on the topic of exercise evaluation, but also on the state-of-the art of **applied exercise evaluation methodologies** as these are publicly documented and used in practice by major civil protection authorities. The **lessons learnt** from the practical application of FAIM in **multiple disaster preparedness exercises** ([4] – [7]) have been exploited for its iterative improvement. The current status of the FAIM exercise evaluation framework is presented in the following section.

2. THE FAIM EXERCISE EVALUATION FRAMEWORK

2.1. Design Methodology of the FAIM Framework

The FAIM exercise evaluation framework directly addresses the specific areas of improvement in the implementation and effectiveness of the exercise evaluation process. In particular, the main **design parameters of the FAIM framework are the following:**

1. FAIM is a **structured methodological framework**, providing guidance for **practically implementing** the evaluation process (directly addressing **AoI1-AoI4**)
2. All activities of the FAIM framework **are explicitly driven by the objectives of the exercise implementation** (directly addressing **AoI1**)
3. THE FAIM framework has **a structured, but broad data elicitation perspective**, utilising multiple sources, multiple evaluators, and multiple tools in order to elicit evaluation information for each exercise objective (directly addressing **AoI2**)
4. The FAIM framework utilises **structured triangulation of raw evaluation information** as the basis for developing the evaluation findings (directly addressing **AoI3**)
5. The synthesis of the FAIM evaluation findings is focused on **facilitating the implementation of the 'way-forward' process** of the disaster preparedness lifecycle (directly addressing **AoI4**).

FAIM offers a **flexible open architecture environment**. The evaluation team can adapt the data elicitation methodologies and tools to be employed **according to the specific parameters of a civil protection preparedness exercise, irrespective of type and size**. Although a full operational description of the FAIM exercise evaluation framework is not possible within the constraints of this paper, a comprehensive outline of its basic operation is provided in the following subsection.

2.2. Phases and Activities of the FAIM Framework

The FAIM comprises five (5) main operational phases. A graphical depiction of these phases as they have been operationalised for the FloodNorthALB Full-Scale Exercise is provided in Figure 1. In particular:

- **PRE-EXERCISE IMPLEMENTATION PHASE**: The main **exercise evaluation plan** is developed, **based on the specific objectives of the exercise implementation**. The Head Evaluator works with the Exercise Design Team, ensuring that **the exercise objectives are unambiguous and 'fit for purpose'**. The specification of the exercise objectives provides the basis for the formation of the **Exercise Evaluation Team**. The evaluation team members possess the necessary expertise in order to elicit and analyse information for the specific objectives considered.

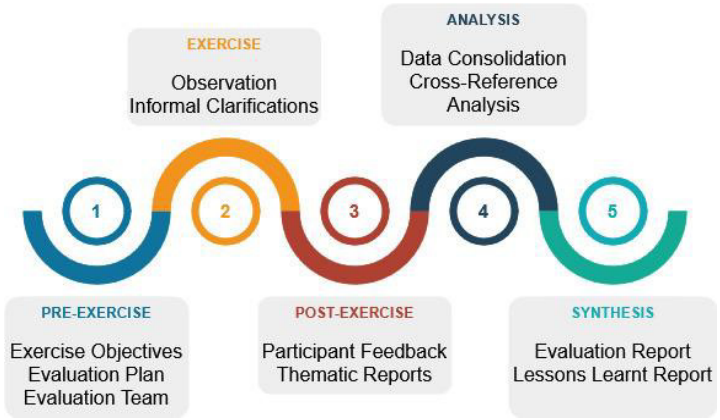

Figure 1. Graphical outline of the FAIM framework (FloodNorthALB FSX operationalisation)

- **EXERCISE IMPLEMENTATION PHASE**: The Evaluation Team members **observe** the exercise activities and capture raw evaluation data **based on pre-defined assignments / placements related to their expertise**. An important **innovation** of FAIM is that the members of the evaluation team are encouraged to request **informal clarifications** on the proceedings from the participants / role players, in order to gain a better understanding of a specific situation related to the exercise objectives.
- **POST-EXERCISE IMPLEMENTATION PHASE:** FAIM foresees two 'sources' of **raw** evaluation information. **First,** the members of the evaluation team develop **technical evaluation reports**, utilising structured tools like **Exercise Evaluation Guides**, but also using **Customised Thematic Evaluation Reports** which constitute **another FAIM innovation.** The latter provide a significant enhancement to current practices, as they allow experts to record in a technical format their observations on critical exercise implementation 'themes' related to the exercise objectives. Second, **all** exercise participants (role players, controllers) provide their feedback on the fulfilment of the exercise objectives by participating in typical post-exercise feedback events (like **HotWash / After Action Review Sessions)**, and by completing **Participant Feedback Forms**.

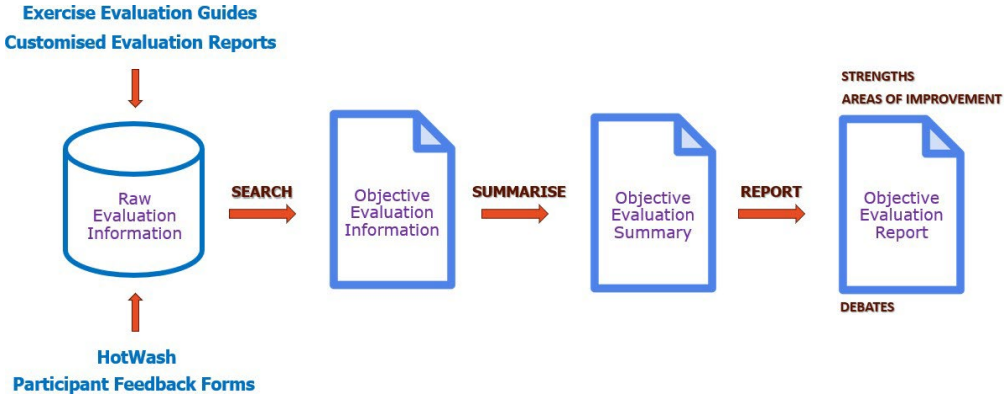

Figure 2. Outline of the FAIM Framework analysis & synthesis phases for each exercise objective

- **EVALUATION ANALYSIS PHASE**: The Evaluation Analysts perform a critical analysis of all raw evaluation data **based on the specific Exercise objectives** (see figure 2 for an outline of the FAIM analysis and synthesis phases). The FAIM analysis phase adopts the concept of **triangulation** in order

to **validate** the outcomes of the analysis (based on the suggestions of Beerens [2]). **This is facilitated by the use** of **cross-reference matrices** which allow the **simultaneous consideration** of all available sources of information for each individual exercise objective. The results of this analysis are categorised as either '**strengths**' or '**areas of improvement**' for each objective considered. However, if the triangulation process is inconclusive, the FAIM framework also **introduces** the category of '**debate**'. Alternative scientific analysis methodologies may also be applied on raw evaluation information, based on the exercise characteristics.

- **EVALUATION SYNTHESIS PHASE:** The evaluation findings are synthesized in the technical '**Evaluation Report**', which provides analytic information on the extent to which the specific Exercise Objectives have been fulfilled. A shorter, focused '**Lessons Learnt Report**' is also produced, highlighting **the key areas of improvement**, as these are identified during the evaluation process. The '**Lessons Learnt Report**' provided a robust basis for the development of the '**Way Forward Plan**' by the responsible civil protection authority which.

3. VALIDATION & FUTURE ACTIVITIES

The effectiveness of the FAIM evaluation framework **as a good practice** has been extensively tested and empirically validated during the implementation of the **UCPM Disaster Preparedness Full-Scale Exercises BALANCE** [4], **HOPE** [5], **PDEX** [6], and **FloodNorthALB** [7]. In particular, the ability of the framework to support the systematic implementation of evaluation activities has been showcased in the **evaluation documentation produced for the previous exercises** (this documentation is available in the results section of each exercise reference). Further testing, validation, and improvement activities are currently conducted as part of the implementation of ongoing large-scale international preparedness exercises. It should be noted that there exists no scientifically validated process which can be readily employed for evaluating the effectiveness of the exercise evaluation process **itself** [2]. It is the intention of the author to contribute towards the development of such a process, which will significantly support the long-term improvement and applicability of the FAIM (or any other) exercise evaluation framework.

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