



## **AUTOMATED FINGERPRINT IDENTIFICATION SYSTEM (AFIS)**

AFIS is a type of biometric system that uses digital imaging to capture a fingerprint, which then can then be compared to a database of fingerprint records to help determine the identity of an individual.

AFIS is a biometrics system commonly used in law enforcement where sets of prints recovered in the crime scene were compared against the database of known and unknown prints.

Law Enforcement AFIS has the ability to perform the following functions:

1. Search a set of known fingerprints (tenprints) against the records of an existing tenprint database (Tenprint Inquiry (TI));
2. Search a latent print from a crime scene against a tenprint database (Latent Inquiry (LI));
3. Search a latent print from a crime scene against the record of existing unsolved crimes database (Latent to Latent Inquiry (LLI)); and
4. Search a new tenprint against the record of existing unsolved crimes database (Tenprint to Latent Inquiry (TLI)).

### **Brief History of PNP-AFIS**

- AFIS was approved under the Japanese General Grant Aid Program (GGAP) in April 1998 in the amount of Y839,291,634 (P419,645,817.80).
- In August 2004, AFIS started operation and was eventually turned over to the PNP in May 2005.

### **Background of the PNP AFIS Project:**

- In 1980 to 1997 – during the incumbency as Chief of Philippine Constabulary crime Laboratory (PCCL) of Col PEDRO ELVAS up to then PSSUPT REYNALDO ACOP, the idea of having an AFIS has been nurtured and carefully laid out. Leg works, studies and initial contacts with the Japanese government were initiated.
- In April - 1998 – then C, PNP PDG SANTIAGO ALINIO signed the letter addressed then NEDA Secretary Cielito F Habito recommend the endorsement to the Japanese Government, through JICA of the proposed AFIS project. The recommendation was made based on the memorandum sent during the incumbency of the PNP Director of Crime Laboratory PCSUPT VICTOR G BATAAC.
- In 1998 – 2001 – conduct of planning activities and sourcing of funds for the required building for AFIS during the incumbencies of then PCSUPT



- HERCULES CATALUÑA, PCSUPT VIRTUS GIL and PCSUPT MATOWE PEDREGOSA as Crime Lab Directors.
- In December 2001 – The construction of AFIS building was started as required counterpart from the Government of the Philippines.
- On July 15, 2002 to August 03, 2002 – JICA sent initial study team to the Philippines.
- On January 19, 2003 – JICA sent to the Philippines its Draft Report on the Basic Design Study.
- On January 24, 2003 – confirmation of the main items of the basic design study report formally signed by the CPNP PDG HERMOGENES EBDANE JR and Mr Motofeni Kohara, the leader of the JICA Basic Design Study (BDS) Team.
- In February 2003 – formal submission of the BDS Report to the Investment Coordination Committee through NEDA.
- On June 30, 2003 – Diplomatic notes were signed and Exchanged by and between then Foreign Affair Secretary Blas Ople and Japanese Ambassador Kojiro Takano which officially sealed the start of the GRANT AID worth more or less 975 million yen.
- In December 2003 – Delivery and installations of the equipments started.
- On August 15, 2004 – formal launching of the AFIS Project.
- September 16, 2004 – Registration/conversion or encoding fingerprint images and details in AFIS started.

### **Purpose of Equipment**

- AFIS is the answer to the labor-intensive and time consuming process of classifying, searching, and matching fingerprint used for identification.
- AFIS is primarily use by law enforcement agencies for criminal identification. The most important of which include identifying a person suspected of committing a crime or linking a suspect to other unsolved crimes. It also helps to identify victim of natural and man-made disasters.
- No matter how competent the evidence technician is at performing his job, the gathering of physical evidence at a crime scene will be futile unless such evidence can be properly processed and analyzed. Since fingerprints are by far the most frequently retrieved physical evidence, making the system of analyzing such prints effective will contribute the most toward greater success in identifying criminal offenders through the use of physical evidence. (Petersilia, 1975, p 12)



## FINGERPRINT



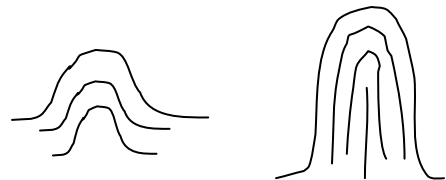
A Fingerprint is the pattern of elevated and depressed (“ridge” and valley”) lines on the surface of fingertips. These patterns contain many identifiable points including the beginning, ending, dot, intersection, or bifurcation of ridge lines. These points are called minutiae. Minutiae do not change as a person ages.

No Two Fingerprint Are Identical and Fingerprints Do Not Change Throughout Life

### TYPES OF FINGERPRINTS

#### 1. Arch

- Simple arch or Tented arch
- These are simple patterns that originate from the left or right side of the fingertip and flow to the opposite side



#### 2. Right-slanted loop

- Loop slanted to the **left** in the print
- Finger number is not relevant



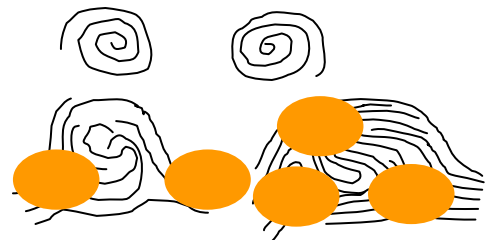
#### 3. Left-slanted loop

- Loop slanted to the **right** in the print
- Finger number is not relevant



#### 4. Whorl

- Has at least one (1) whorl or has at least two (2) Deltas
- These patterns are circles, ovals, or swirls formed around the center.



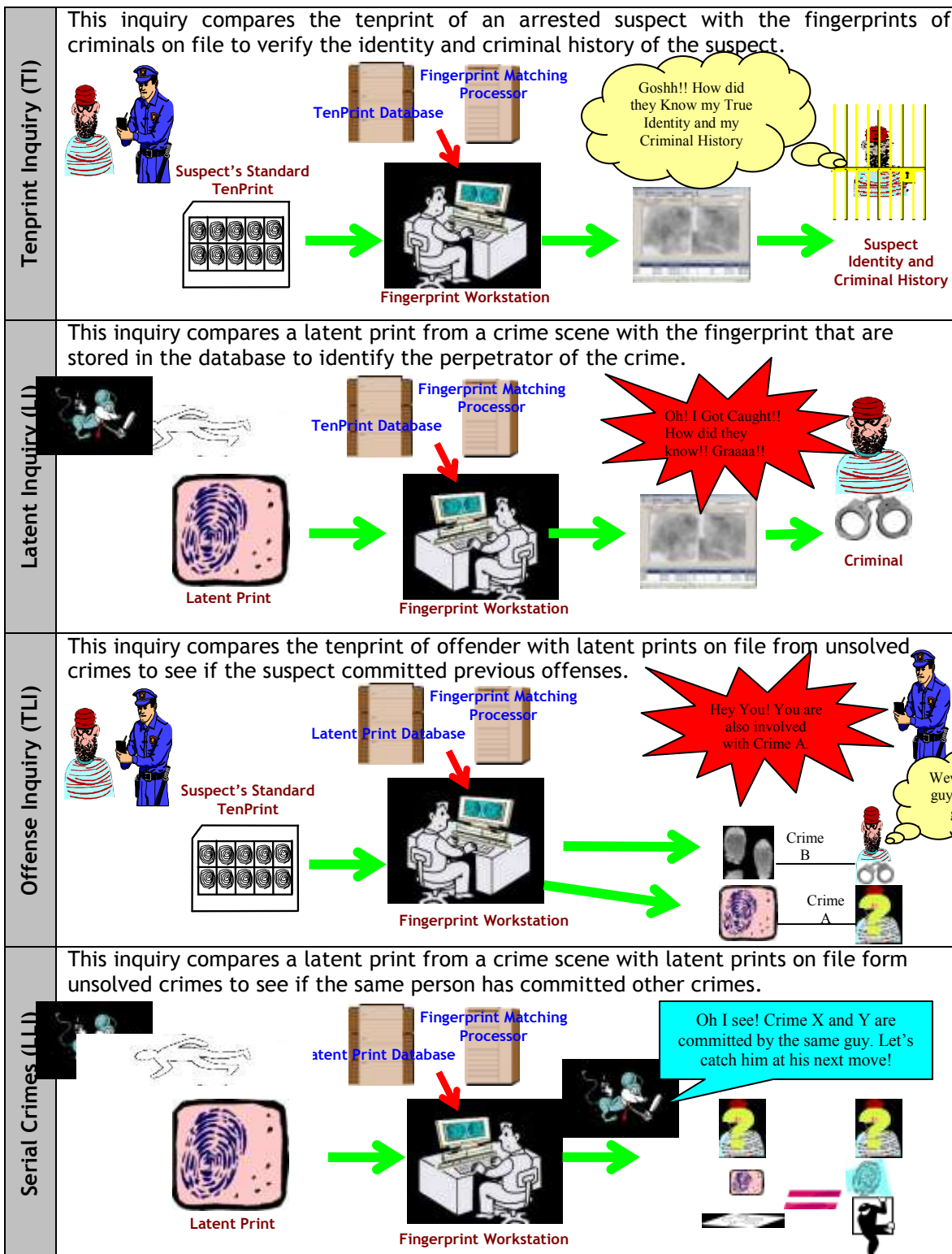
#### 5. Scar

- Contains scar that obscures determination of Pattern Type
- Finger is amputated or bandaged





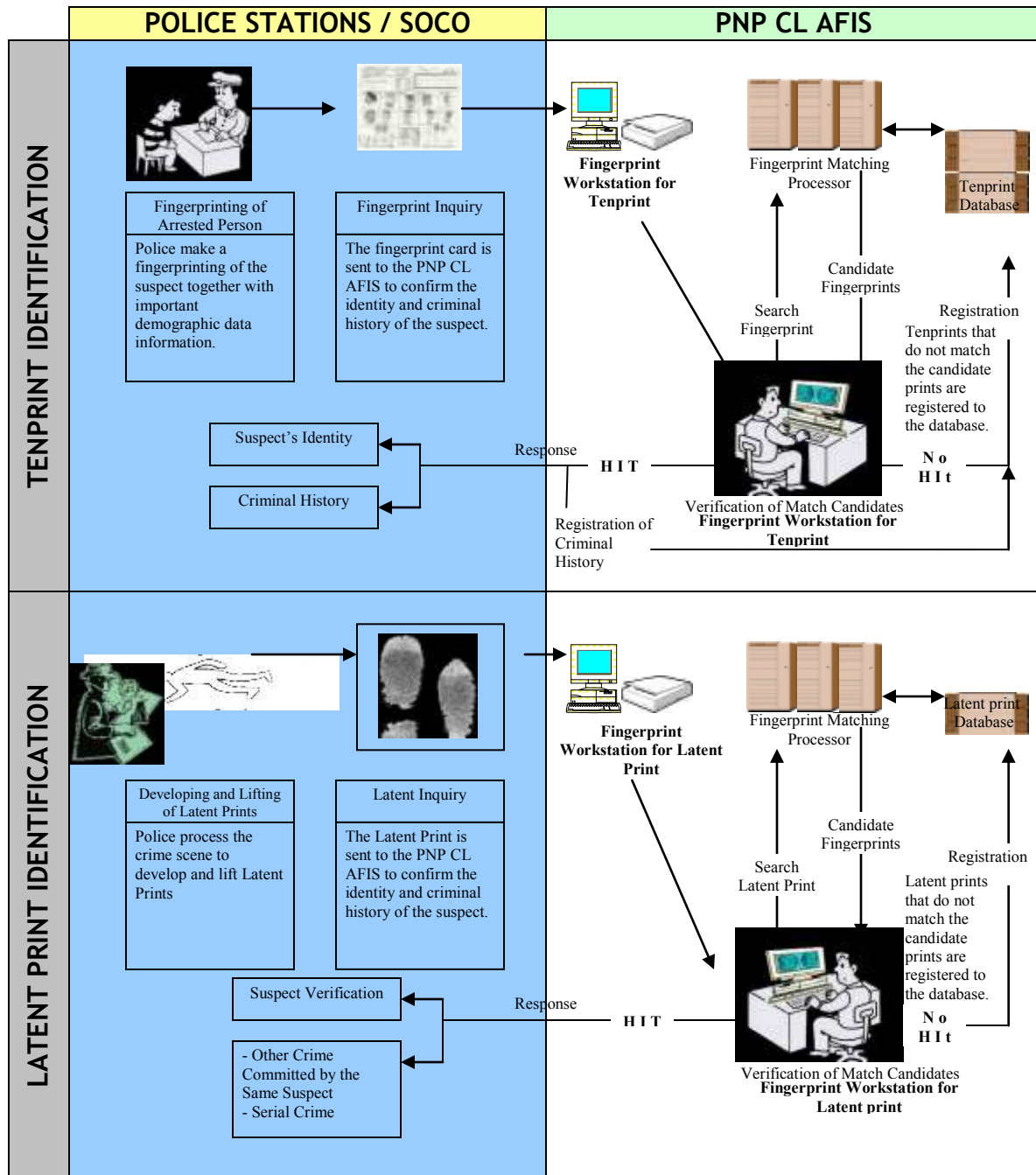
## Functions of AFIS





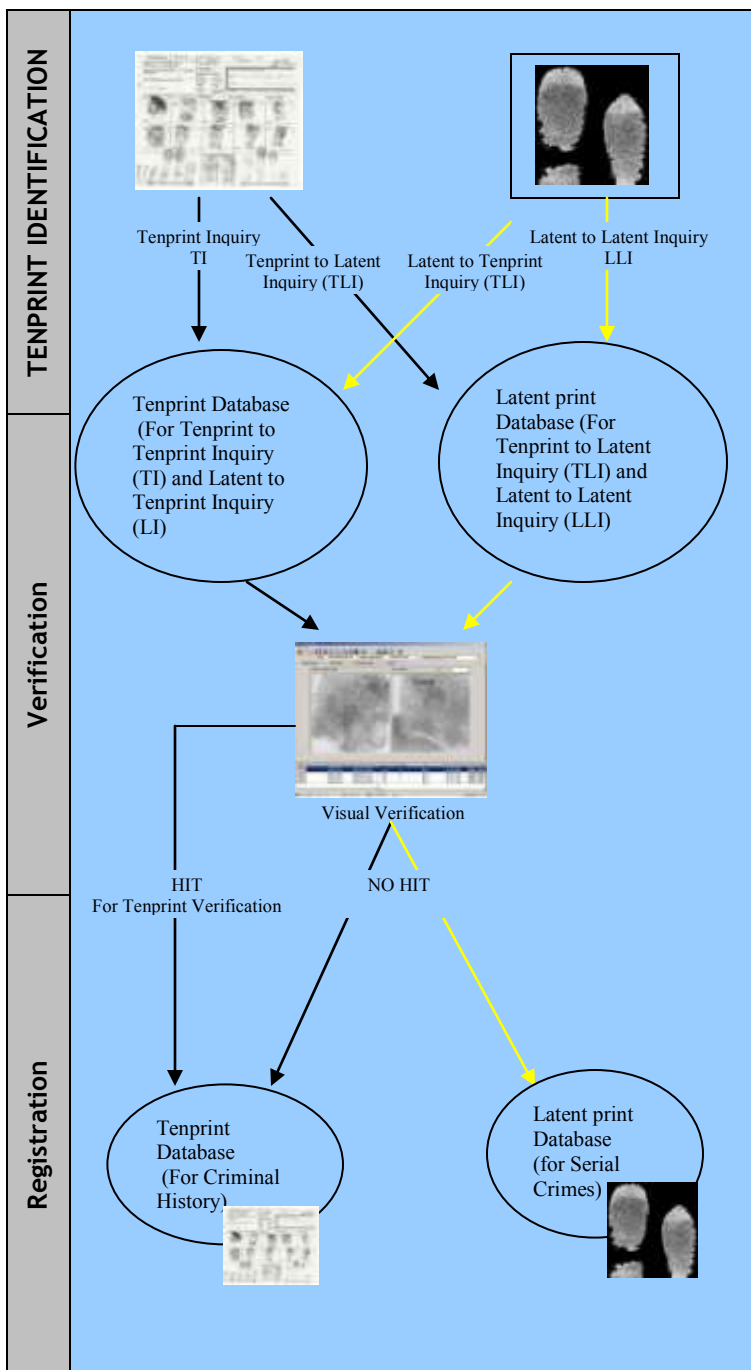
## FINGERPRINT IDENTIFICATION

There are two types of fingerprint identification: Tenprint Identification used to confirm the identity and criminal histories of arrested suspects, and Latent Print Identification using latent print from the scene of a crime to identify a suspect. The PNP Crime Laboratory (PNP CL) uses an Automated Fingerprint Identification System to process these operations. The procedure of fingerprint identification is as follows:





**FINGERPRINT IDENTIFICATION SYSTEM**



**1. Outline**

**File Types**

The Fingerprint Identification system has a Tenprint Database that contains the minutia data for rolled prints, and a Latent print Database that contain the minutia data for latent prints. Both Databases have their own Fingerprint Image Database that contains the images of the fingerprints.

**File Function**

The Tenprint Database is used for Tenprint to Tenprint Inquiries (TI) and Latent to Tenprint Inquiries (LI). The Latent print Database is used to check if the arrested suspect has committed a previous crime (TLI) and check also if the collected Latent print match with another unsolved crimes (LLI). The images of the candidate fingerprints are retrieved from the Fingerprint Image Database and displayed on the fingerprint workstation.

**2. Characteristics**

**Partial Fingerprint Inquiries**

In addition to clear fingerprints that have been rolled on the fingerprint cards, partial fingerprints can also be searched.

**Automatic Extraction and Registration of Minutia**

The minutia of tenprint and latent prints are automatically extracted and registered in the tenprint and latent database respectively.

**Reading Speed**

Conducts searching for 40,500 fingerprints per second

Ex: search a print versus 10 million fingerprints in less than 4 minutes  
(It would take over 25 years for Fingerprint Examiner to conduct the same manually)

**Verification Using Fingerprint Images**

The images of tenprint and latent prints are stored on istorage disk. Candidate images resulting from an inquiry are automatically retrieved from these istorage disks and displayed on the Fingerprint Workstation





**Registered in PNP-AFIS Database as of December 09, 2013**

|              | <b>2004 -2013 TOTAL</b> |
|--------------|-------------------------|
| Tenprint     | <b>702,587</b>          |
| Latent Print | <b>16,994</b>           |

**AFIS “HITS”**

A “HIT” is a term used if the findings of an AFIS examiner/operator matched the search print and the file print in the database.

**No. of AFIS HIT as of April 15, 2013**

|           | <b>2004 -2013 TOTAL</b> |
|-----------|-------------------------|
| Hit Cases | <b>319 cases</b>        |

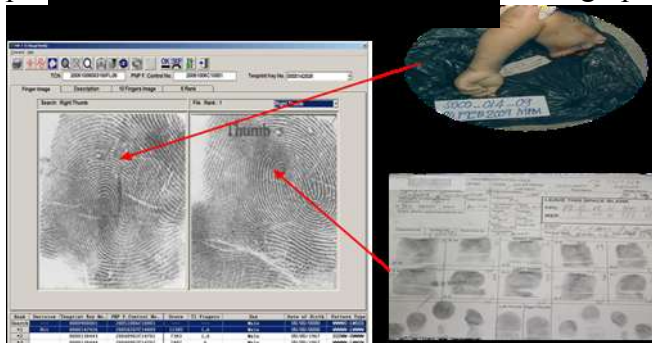
**PNP-AFIS Significant Hits**

a. Post mortem Identification

February 2009 - A human body parts particularly left right arm of a suspected malefactor and believe to be a victim of summary execution was found at Maligaya Park, Fairview, Quezon City

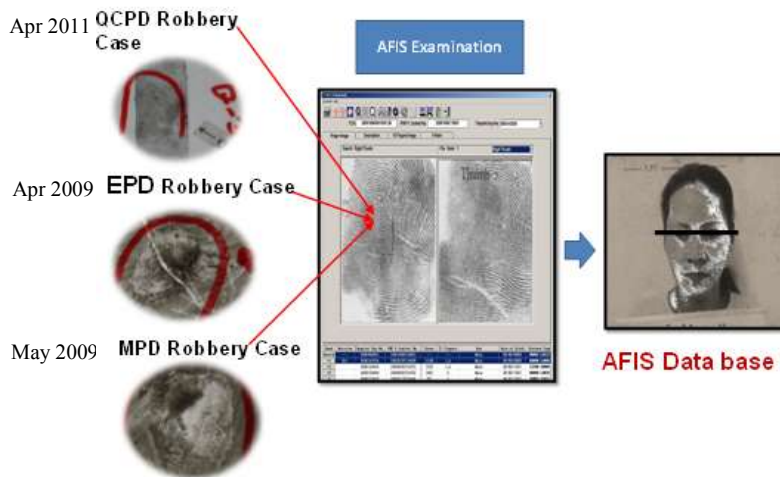


Impressions were completed in less than an hour that yielded to the positive identification of the fingerprints





b. Identification of suspect (Series of Crimes)



c. Identification Other Identity and Criminal History



The AFIS is about to reach its obsolescence in this year because the hardware is no longer available in the market as per NECJ letter on July 20, 2010 and the end of its maintenance in 2013. To prolong the lifespan of AFIS the PNP bought spare parts needed as recommended while waiting for the UPGRADING/REPLACEMENT of AFIS.

The PNPCL recommend an estimated amount of 329 million for the purpose. However, these amounts were reduced to 270 million by the UESB, down to PNPDL for procurement but due to some reason the procurement of AFIS budget is now at the DBM.

This unit is looking forward for the success of the UPGRADING/REPLACEMENT of AFIS for speedy identification of unidentified suspect through fingerprint for the early



AFIS



solution of crime and administration of justice to include the identification of unidentified victim of natural and manmade disaster for their family and relatives and, to the victims dignified burial be given to them as last respect from their love one.