CHAPTER - III

METHODOLOGY

Research is a careful inquiry through search for new facts in any branch of knowledge. (The advanced Learner's Dictionary of current English, 1952). Research methodology is a backbone of any research as it provides concrete guidelines to the researcher in any field. By paying due attention to research designing and following the suitable methodology, this chapter focuses on the research methodology and its various components used in this research.

This chapter of thesis describes operational definitions of terms used in present study, hypothesis, data collection method, coding of data and data analysis in detail.

Operational Definitions of Terms Used in Present Study

Investigating Agency

The term investigating agency refers to police agencies who plays preliminary role in investigation of any crime.

Forensic Science Laboratory (FSL)

FSL stands for Forensic Science Laboratory. In the present study, FSL term is used for any Central, State or regional forensic Science laboratory where the evidences collected by the police are sent for scientific analysis.

Forensic Evidence

Any form of material viz. biological, chemical, physical, firearms, fingerprints & footprints, questioned documents, toxicological, computer, cd or any audio video tapes, recordings, digital images including photographs etc., collected by investigating officer/medical officer and sent to FSL is referred as Forensic Evidence.

Evidence Appreciated

The term 'evidence appreciated' is used for the status of evidence which is recognized and accepted by court of Law.

Evidence Withheld

The term 'evidence withheld' is used when the evidence is not considered or acknowledged owing to any reason by court of Law.

Evidence Dropped

From the time FIR is lodged and the crime is registered, the investigation starts. From preliminary enquiry level till the investigation is completed by filing the charge sheet, investigating agency and the courts seek the assistance of Forensic Science Laboratory and services of Forensic Experts. The reports of Forensic Science Laboratory are for the consideration till the trials are completed and case judgments are delivered. Thus the interest of the researcher in the present study is to first of all to find out the importance and value attached to the Forensic Science Laboratory reports by investigating agency, Public prosecutor, defence lawyer, and finally by the honourable court. Secondly to critically evaluate to what extent the Forensic Science Laboratory reports were useful and effective in delivering judgments to justice delivery system. Thirdly any further scientific advancement required to improve the quality of forensic science reports so that Forensic Science Laboratory reports become admissible in all cases. If there are any loopholes/gap in the system because of which Forensic evidences get dropped at different levels, an effort to tie the loose ends and fill the gap can be suggested so that all forensic evidences in future can become inevitable, but reliable evidence that needs to go through the scrutiny of courts during trial. Once the Forensic Science Reports reach Daubert's standards, all effort can be made at different levels by the agents of criminal justice system involved to ensure that proper weightage is given to forensic evidences in justice delivery system before they are dropped, rejected or appreciated. This would help in

developing a strong Forensic Science Support system to aid both investigating agencies as well as courts resulting in better conviction rate.

Thus the researcher in the present study is keen on exploring at which level forensic evidences were dropped? Why were they dropped? What is the solution? How to address it for the future improvement?

Thus, the cases referred to Forensic science laboratory and their reports consideration or drop at different levels are critically evaluated and is termed as 'Evidence Dropped' in the present study.

Hypothesis

$H_0 1$: There is no significant relation between status of Forensic Evidence and Final verdict of Gujarat High Court.

$H_0 2$: There is no significant relation between status of Forensic Evidence and Final verdict of Supreme Court of India.

Methodology

This part describes research method used, sampling technique, sample size, validity and authenticity of data, research instrument, data coding and data analysis.

Research Method

This research is aimed at finding out the ethnographic aspect of forensic evidence and it's fidelity in criminal trials. The research method applied to conduct this study is *Qualitative and Descriptive* in nature. Descriptive studies are concerned with describing, recording, analysing and interpreting the existing conditions. "It involves some type of comparison or contrast and attempt to discover relationships between existing non-manipulated variables". (Best, 1977). The present study is descriptive by means of finding significance and describing the utility of forensic evidence. This is a critical analysis of such evidence in Indian Justice System. The study involves statistical interpretation of data to represent

precise results. It is a Qualitative approach concerned with evaluation of the judgments with reference to forensic evidence.

Universe of Study

The universe of the present study is judgments delivered in Criminal cases by Hon'ble Gujarat High Court and Hon'ble Supreme Court of India.

Data Collection and Sampling Method

The sampling technique is determined as per the objectives and the need of the study. For the present study "Stratified Sampling" method is employed. This method is used when the relevant characteristics of the sample are known and identifiable. Essentially stratified sampling method involves dividing the population in the subgroups, called 'strata' and drawing samples from them. (Kumar A. , 2002)

In the present study, judgments pertaining to forensic evidence out of all judgments are the samples drawn from different subgroups. The researcher has started data collection from open source during January-2015. A procedure to acquire furthermore data from Directorate of Forensic Science (DFS), Gandhinagar was initiated in March-2017. Classification and analysis of data was started along with data collection. Thus, data collection and analysis was carried out simultaneously by the researcher.

The Judgments delivered by Hon'ble Gujarat High court in all criminal appeals and judgments delivered by Hon'ble Supreme court of India in rape cases from the year 1951 to 2015 pertaining to Forensic evidences are considered for this study. The judgments are collected using the judgment database "GLHEL–THE LAWS".

Several search strategies were used to identify judgments, availability in database that met the preliminary eligibility criteria. The intention was to avoid bias resulting from searches that were not comprehensive. These strategies included a keyword search of databases, searches of relevant judgments, checking

of basic details like case history, appeal type of relevant cases, and contact with experts. Concerning the huge quantity of judgment and the critical analysis part to be undertaken in the study use of key words like "forensic", "FSL", "evidence", "fingerprint", "voice", "audio", "ballistic", "polygraph", "Narco", "brain mapping", "BEOSP" etc. are used to select the appropriate judgments from the database.

Sample Size

The selected judgments in the present study are technically identified as sample. In the present study the Judgments delivered by Hon'ble Gujarat High court in all criminal appeals and judgments delivered by Hon'ble Supreme court of India in rape cases pertaining to Forensic evidences were identified and selected as sample. All criminal case judgments of Supreme Court were gone through, but it was beyond the scope of the present study to consider all the judgments, thus; only rape case judgments were considered for the study as extreme hike in magnitude of rape crimes has been observed during last couple of years all over the nation making it critically important for study.

By means of keyword search method, researcher could get 682 Gujarat High Court judgments and 64 judgments by Supreme Court of India by searching judgments of nearly 65 years. The analysis was carried out on 746 judgments and thus this research is limited to judgments delivered by High Court of Gujarat in a span of 65 years wherein forensic was mentioned and 64 rape case judgments of Supreme Court of India delivered in a span of 65 years where in forensic is mentioned. Thus, this research and the outcome is based on 746 judgments.

Validity and Authenticity of Data

The comprehensive assessment of impact of forensic evidence on criminal trials is a strong need to improve rationality in criminal justice. Since the present study is a critical evaluation of role of forensic evidences in judgments, the judgments were collected as research data. The collection of these judgments was carried out using the judgment database "GLHEL – THE LAWS" where GLH – Gujarat Law Herrald is a journal of Bar Council of Gujarat in

electronic form. The database "GLHEL – THE LAWS" is a platform, providing all type of judgments, Acts rules, Regulations etc. given by Supreme Court of India and Various High Courts of India, in collaboration with Bar Counsel of Gujarat.

Dropped Data

The data was obtained by means of keyword search like 'Forensic' and 'FSL'. This is the method in which all the documents containing the key word entered will be fetched from the database. Hence, as per this logic all the judgments having word 'forensic' and 'FSL' were obtained. While reading these judgments during analysis, some judgments found containing these words but not relevant to the forensic evidence. Such data has been dropped to above stated reason and consequently not considered for the present study.

Criteria for data collection. The following are the criteria based on which the judgments are fetched from database and considered as sample for the present study.

1. Judgments of only *Criminal appeals* are considered for the present study.

2. Judgments wherein *forensic evidence* is mentioned are considered as data for the present study.

The Details regarding total collected data, considered data for study and lost data is given in the following **Table - 3.1.**

Table-3.1 Details regarding total Collected Data and Dropped Data

Sr. no	Court	No. of Judgments Collected	No. of Judgments considered	No of judgments lost	Reason for drop of data
1.	High Court of Gujarat	682	634	48	not relevant to the criteria defined for the present study

2.	Suprem e Court of India	64	56	8	not relevant to the criteria defined for the present study

Research Instrument/Tool.

Research tool may be defined as "Anything that becomes a means of collecting information for your study is called a research tool or a research instrument." For gathering information and exploring new fields, the researcher may use various research devices. The following tools were selected and used by the researcher in the present study.

- GLH – Gujarat Law Herrald is a journal of Bar Council of Gujarat in electronic form. The database "GLHEL – THE LAWS" is used for the present study. The samples were collected using this database.

- Searches were also conducted using the Internet search engines: Google; MSN Search and Yahoo.

Ethical Consideration Specific to Research

Ethics are the norms or standards for conduct that distinguish between right and wrong. To acquire ethical clearance for any research is a primary and essential step during conduction of research study. For the present research work on study of judgments, the ethical clearance Certificate **(Appendix-A)** was obtained from Ethical Clearance Committee of Raksha Shakti University, Ahmedabad, Gujarat. Ethical clearance was given with an advice to not refer the names of Rape victims in the thesis. The present study is executed by following the given suggestion.

Data Storing and Handling

Data handling is the process of ensuring that research data is stored, archived or disposed off in a safe and secure manner during and after the conclusion of a research project. (Data handling, 2017) For the present study, data handling and storing is encompassed in electronic way using computer and laptop.

For this data integrity has remained primary concern to ensure that data recorded is not altered, erased or lost. The data was classified on the basis of time frame and stored in different files to make access adaptable and easy.

Coding of Data

After all data has been collected the next step is processing and analysis of data. The first step in this direction is classification and tabulation. The judgments were classified on the basis of type of court and subsequently the particulars derived after analysis were tabulated in data-sheets. The coding strategy used is as follows:

Coding for decade. The judgments were classified as per the decades in which judgment delivered. The decades were classified as 1951-1960, 1961-1970, 1971-1980, 1981-1990, 1991-2000, 2001- 2010 and 2011-2015. Different decades were coded differently as shown in below **Table - 3.2.**

Table-3.2 Coding for Decade

Year	Code
1951-1960	0
1961-1970	1
1971-1980	2
1981-1990	3
1991-2000	4
2001-2010	5
2011-2015	6

Coding for crime type. Considering wide array of crimes, all the cases were categorized broadly in the following types of Crime along with the code.

Murder (code '0'). This category included all homicide and murder cases as well as murder crimes in combination of other (relatively) minor crimes like kidnapping, theft, decoity, domestic violence, voluntarily causing grievous hurt, atrocity, poisoning, rioting, sale of noxious food and drink, terrorist attack and unnatural offence.

Culpable homicide not amounting to murder (code '1'). This category included the said culpable homicide not amounting to murder and also the said crime in combination with voluntarily causing hurt.

Abetment of suicide (code '2'). This category included cases of abetment of suicide as well as the same crime in combination of other crimes like domestic violence and dowry death.

Attempt to murder (code '3'). This class of crime consists of crime attempt to murder and the said crime in combination with domestic violence.

Rape (code '4'). This category included all rape and gang-rape cases as well as rape crimes in combination of other (relatively) minor crimes like kidnapping, wrongful confinement, atrocity and abetment of suicide.

Rape and murder (code '5'). The rape and murder both being heinous crimes, this has been classified as a separate category. This also included the cases of kidnapping and wrongful confinement with rape and murder.

Possession of illegal drugs (code '6'). All the Narcotic drugs and Psychotropic substance related crimes like possession, cultivation and/or consumption of such illegal drugs are classifies in this category.

Illegal consumption of alcohol (code '7'). This category is created because Gujarat being 'Dry State', consumption of alcohol is a crime in the state of Gujarat. The cases pertaining to Gujarat High Court are considered for this study and hence this category is separately defined.

Adulteration of petroleum products (code '8'). Adulteration of any kind of petroleum product like, petrol, diesel, kerosene etc. are classified under this category.

Food adulteration (code '9'). Adulteration of any kind of food product is categorized in this class.

Corruption (code '10'). Cases of corruption are coded as per this class.

Counterfeiting of currency (code '11'). This category included crimes of counterfeiting of bank notes or currency notes as well as possession of forged/counterfeit currency.

Miscellaneous (code '12'). This category included all other crimes not pertinent to above stated crime type. This incorporated crimes like spying, possession of explosives under suspicious circumstances, waging or attempt to wage war, cheating, dishonesty, forgery, possession of prohibited arms, assault, mal-practicing in petroleum products and voluntarily causing hurt/grievous hurt.

Coding for type of evidence. Different codes were given to different type of evidences. The types of evidences differently coded are given in the following **Table-3.3.**

Table-3.3 Sub-Categories of Evidence type for coding

Evidence type	Sub categories meant for coding	Code
Biological Evidence	Blood stained articles (Including clothes and weapon)	0
	Blood Sample	1
	Semen	2
	Vaginal Swab/smear	3
	Pubic hair	4
	Saliva	5
	Hair	6
	DNA profiling	7
	Nail	8
	Bones	9
	Some Evidence	10
Physical Evidence	Weapon	0
	Soil	1
	Currency notes	2
	Electronic evidence	3
	Vehicle	4
	Voice sample	5
	Miscellaneous evidences	6
Chemical Evidences	Narcotic drugs & Psychotropic Substances	0
	Petroleum hydrocarbons	1
	Petroleum fuels	2
	Food products	3

	Phenolphthalein / Anthracene	4
	Explosives	5
	Alcohol	6
	Miscellaneous	7
Firearm (Ballistics) evidences	Firearm	0
	Any type of Ammunition or part	1
	Gun-shot residue/Barrel wash	2
	miscellaneous	3
Fingerprint/Footprint	Finger print	0
	Foot print	1
Questioned Document	Handwritings	0
	Forged document	1
Toxicological Evidence	Viscera	0
	Stomach wash/vomit	1
	Any physical material	2
Medical Evidence	Wounds & Injuries	0
	Medical opinion	1
	Bones	2
Psychological Evidence	Polygraph, Narco and/or Brain mapping Test	0
	Insanity Report	1

Coding for evidence drop level. As mentioned in the before, while looking over to the importance and value attached to forensic laboratory reports by investigating agency, Public prosecutor, defence lawyer, and finally by the honorable court; because of any loopholes/gap in the system, it is seen that forensic evidences get dropped at different level. The evidence drop level were categorized in six various levels and coded as shown in below **Table-3.4.** Six levels are: Investigating agency, FSL, Forensic medicine, prosecution, Court and Witness/Panch hostility.

If the forensic evidence could not reach beyond police investigation, the level of drop for such cases is categorized as 'Investigating agency level'. If the forensic evidence could not reach beyond forensic analysis, the level of drop for such cases is categorized as 'FSL level', similarly the 'forensic medicine level' is also categorized. If the evidence reach up to prosecution level but could not show evidentiary value in front of judges, the level of drop for such evidences is defined as 'Prosecution level'. Some evidences are not considered as a result of witness turn hostile, this is also classified as a separate level of drop. If the evidence reach

up to last level of court trial, but got rejected by the judges, this is classified as 'court level' of drop.

Table-3.4 Coding for level of evidence drop

Level of evidence drop	Code
Investigating agency	0
FSL	1
Forensic Medicine	2
Prosecution	3
Court level	4
Hostile witness	5

Coding for status of evidence. The status of evidence in court i.e. whether the evidence got appreciation by court of law, withheld by court of law or status not mentioned in the judgment are three different status. These status were given separate coding for each as shown in below **Table-3.5.**

Table-3.5 Coding for status of evidence

Status of Evidence	Code
Appreciated	0
Withheld	1
Not mentioned	2

Coding of final decision by court. The final verdict given by court are categorized as conviction, acquittal and other. The bail applications and petitions are characterised as 'other' for present study. These three categories were coded separately each.

Table-3.6 Coding of final decision by court

Final Verdict of the Court	Code
Convictions	0
Acquittal	1
Other than conviction and acquittal	2

Statistical Analysis

After all data has been coded next step is processing and analysis of data. The first step in this direction is classification and tabulation. The judgments were classified on the basis of type of court. Further, the judgments were classified as per the year in which judgment delivered. For the interpretation or the analysis of collected data, statistical methods are used. Lord Calvin rightly says "When you can measure what you are speaking about, and express it in numbers, you know something about it, but when you cannot measure it, when you cannot express it in numbers your knowledge is of a meagre and unsatisfactory kind. (Kumar A. , 2002)

To check difference and relation between status of evidence (appreciated/ withheld) and final judgment of the court (acquittal / conviction) cross tabulation and Pearson chi-square methods were used. Statistics provide description of facts by means of numbers. So we can have the clear picture of the situation. Statistical analysis was done by SPSS (v16.0) computer software package.

Complete Procedure

The study is conducted on judgments delivered by Hon'ble Gujarat High court and Hon'ble Supreme court of India from the year 1951 to 2015 pertaining to Forensic evidences. The researcher has gone into exhaustive details of the laws & case records, has personally conversed with the legal and forensic experts, relevant legal and forensic literature were studied and evaluated in individual case without bias.

The judgments were collected using the judgment database "GLHEL – THE LAWS". Any physical material recovered from crime scene when examined in Forensic Science laboratory (FSL) may provide information of concealed details about the crime, such evidences are termed as forensic evidences. Concerning the huge quantity of judgment and the critical analysis part to be undertaken in the study use of key words like "forensic" and "FSL" were used to elect the appropriate judgments from the database. By means of this filtering method, 682 Gujarat High

Court judgments and 64 judgments by Supreme Court of India were sorted out, which have been used as data for the research. The thorough evaluation of elected judgments with reference to research objectives was done to review the role and significance of forensic evidence in the criminal case outcome. The particulars of each judgment, case detail, outcomes retrieved after judgment analysis like nature of crime, type of forensic evidence collected, exhibit status of that evidence, forensic evidence appreciated/withheld by court of law; if withheld, the level of drop etc. is coded and organized in a tabular form to make it feasible for performing statistical evaluation. The statistical interpretation of data is performed. An attempt is also made to avoid any error as far as possible. The study is concluded by both the subjective and objective findings by analysing the data obtained during research.