

Criminal Trial in Absentia in Bangladesh: A Comparative Study

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Abstract: *The appearance of both parties before the court is a common rule for continuing trial, especially in criminal proceedings as it is an established principle that every criminal case must be proved beyond reasonable doubt. In complying with the requirement of natural justice no one will be punished unheard, trial in absence of the accused is discouraged. Offenders often try to misuse the privilege of this rule to hamper trial which is eventually causing impediment in maintaining criminal justice system. For these difficulties, the legal system of many countries including Bangladesh provides trial in absentia in special circumstances maintaining essential precautions. This article discusses the application of trial in absentia in Bangladesh with its historical development along with the reference of the relevant international norms and comparative practices of states locating recommendations fit for Bangladesh.*

Keywords: *Criminal Justice, Trial in Absentia, Accused/Defendant*

1. Introduction

“Trial ‘in absentia’” is a very common phenomenon in the criminal justice system all over the world. ‘To be present before the court’ is a right as well as the duty of a defendant for the sake of fair trial. Sometimes offenders are seen to be absent before the court and the question arises whether the courts should carry on trial proceedings or not. If the court waits for a long or undefined period of time, it might be detrimental to the victim and also to the state itself. A very common legal narrative is used about the justice system as ‘Justice delayed justice denied’. It is basically for want of proper evidence and witnesses, criminal cases

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may be hampered as it must be proved beyond reasonable doubt. In Bangladesh trial in absentia is allowed in the criminal justice system by inserting section 339B of the Code of Criminal Procedure, 1898 from 1982 with some conditions (Sarker, A.A. , 2016, pp. 202-203) as per the standards of the ICCPR (International Covenant on Civil and Political Rights) (ICCPR,1966). Various international and domestic laws stated and tribunals opined this procedure in a critical way where both sides of a coin can be seen. Though most of the opinions exist against this trial, for the purpose of justice, in some particular aspects, is allowed. The article is about the trial in absentia in Bangladesh to find out whether it should be practiced in the socio-legal perspective of Bangladesh or not. Various international laws and national and foreign case laws have been explored and reviewed in the related area to locate the best possible solution for Bangladesh with the comparison of international legal perspectives. Here qualitative method has been applied and, therefore, consulted on corresponding domestic, international statuses and case-laws as the primary sources. In addition, related articles, reports, research works have been used as secondary materials. The research undertaken through this paper would add some fresh insights to the academic spectrum of criminal justice system in Bangladesh. Whereas absentia in criminal trial is frequently debarring the essence of justice, the ensuing research can be seen a timely response and qualifies the required novelty.

2. Trial in Absentia: Epistemological Evolution

In today's context, Trial in absentia is very important to maintain natural justice and to fulfill the requirement of fair trial where it is said that 'Justice not only be done but also seen to be done'. To defend himself and by his pleader is a right of a defendant and to try the case in the absence of the defendant or his pleader raises questions for fair justice. And for this, sometimes offenders intentionally want to avoid the process of law by manipulating this benefit.

The term trial '*in absentia*' is a Latin one which literally means 'in the absence of' (Duhamel's Law Dictionary). According to Oxford Dictionary '*in absentia*' means 'while not present at the event being referred to' (Hornby, N.S, 2010, p.654), also means 'in absence of someone' (Garner, B.A. 2011, p. 827). It denotes running a trial in the want of a litigating party, specially refers to the defendant in a criminal case where he is not physically present before the court of law to defend and testify himself or by his pleaders. But in many jurisdictions, where an accused does not appear in person before the court to challenge or to respond charges, is treated a violation of the doctrine of natural justice, especially '*Audi alterem partem*' which means 'hear the other side'.

The concept of trials *in absentia* is neither modern nor unique rather it gets its

background with the foremost track of European history. The law of early Anglo-Saxon period made essential the attendance of a defendant before county court five successive sessions and if any party fails to appear equated to the status of a fugitive at the last occasion. Later, the trial by jury has been introduced by common law and the presence of the defendant has been still necessary and so trial *in absentia* is not disposed of well. Such as Supreme Court of the United States did not allow the trial *in absentia* when the accused is entirely found absent from the commencement of the proceeding, but this ruling is restricted to the hiding in the middle of a trial and to troublesome (please see the original version) carrying out of the defendant for which he may be removed from the courtroom (NSJPP, 2018, p. 2-4).

In Polish legal culture, it (use the noun) was largely used against elusive traitors (real or presumed) and often referred as a “proposal for conviction” to consider. Its use is usually limited to minor misdemeanor cases (NSJPP, 2018, p. 4-5). As the accused are backed by a large number of rights of the constitution by the state, they can exercise their privilege to be present in pre-trial stages, trial period and post-conviction procedures including hearing restitution of and even in all court proceedings. Then again, without jeopardizing the nature of their case, they may have the option to waive their attendance at some court proceedings. But their absence at trial creates potentially a problematic scenario for them as their presence is repeatedly needed for fair trial and natural justice.

Either intentionally or otherwise, some defendants do not demonstrate for listed trials or their stoppage of doing such could cause the result of a trial *in absentia*. In this case, the state is geared up continuing amid the arrangement of its proceedings and the trial may move ahead at judge’s discretion. The Arizona, a state in the southwestern USA, Criminal Procedure Rules sets up that a criminal court may act such, if the court believe that the accused willingly non-appeared himself as recognized by the reality that the accused had individual information of the proceeding period and that he was properly instructed of its going onward. It means that guilty of a criminal offense could be judged against an accused by failing to show up, and arrest warrant will be issued to oblige his attendance at sentencing. However, the presiding judge, with appropriate notifications to the parties and by considering circumstances, is the authority to decide to conduct a trial *in absentia*. On the other hand, a summon or warrant for arrest can be necessitated to issue by the court to secure the defendant’s attendance to ponder on party’s absence and for the sake of justice, the trial could be rearranged again (Wisner, 2015).

A trial *in absentia* means a trial in the non-attendance of the accused during court proceedings. After that, the term 'trial' in the framework of '*in absentia*' is not bearing one implication only. Rather it refers to or "a total '*in absentia*' trial" or "a partial '*in absentia*' trial". In the first instance, the accused is not present in the whole criminal procedures from its investigation stage to the sentencing stage and in the second phase, the defendant is absent only for a hearing or session of the total proceedings and here he is still under the management of the court to suffer a sentence, if found guilty. Here, the accused may be absent for various reasons such as he may waive his being there at proceeding, may be detached from the courtroom due to his unruly behavior, or his physical state may hamper his attendance in the courtroom (Hadi, M. , Hossein, Z. & De Brouwer, A. M., 2015,p. 181-214).

Though to be present before the court is a right of the defendant, sometimes conducting a trial *in absentia* is rationale to avoid the determined delay of the court of justice by the offender. Now, the question may be raised what kinds of absences shall be treated in this perspective either complete absence of the defendant, without legal representation or legal representation is required.

There are different criteria for this. Some legal systems find the accused to be 'present' for legal purposes if they made an initial appearance before the court. For example, in a *Prosecutor v Akhbar Beirut S.A.L. and Ibrahim Mohamed Ali Al Amin* (2014) case, an accused heard the charges of contempt appeared by video link and pled 'not guilty'. Subsequently he refused to make further appearances or to acknowledge the authority of the court. The Special Tribunal for Lebanon found that the subsequent proceedings against him did not constitute a trial *in absentia*, despite the fact that the defendant was not present after the initial appearance (International Bar Association (IBA) Report, 2016, pp.-2-13).

3. Application of Trial in absentia in Bangladesh:

The trial *in absentia* refers to the trial and recordings of evidence without the presence of the accused. In Bangladesh, the general rule is that the accused must be tried in the open court in the presence of him or his pleader during hearing and also in the time of pronouncing judgment (Huq Zahirul, 2015,pp.574-580). But there are some other provisions in specific laws existing in Bangladesh which deals with exception of this general rule. In spite of issuing all the due processes including summon and arrest warrant, if the accused does not appear before the court or cannot be arrested, steps should be taken to hold a trial in the absence of those fugitives, both in Complaint Register (CR) and police cases. Before passing such an order for trial *in absentia*, some direction should be followed

according to the Code of Criminal Procedure, 1898 (Sarker, pp. 202-203). This procedure is also being implemented in the cases of war crimes and some other grave crimes where the criminals are away. To get in-depth idea about the *trial in absentia* in Bangladesh, we should go through the relevant legal framework in Bangladesh first.

4. Legal Formwork Relevant to *trial in Absentia* in Bangladesh:

As a part of criminal justice, the trial procedure is basically regulated by the procedural criminal laws of a country. In Bangladesh, the Code of Criminal Procedure, 1898 deals with the basic provisions of the trial including *trial in absentia* along with some other special laws. The governing laws of Bangladesh relating to trial in absentia are as follows:

- The Code of Criminal Procedure, 1898
- The Nari-O-Shishu Nirjatan Daman Ain, 2000
- The Special Powers Act, 1974
- The International Crimes Tribunal Act, 1973

All evidences shall be taken in the presence of the accused or his pleader as per section 353 of the Code of Criminal Procedure, 1898, if his personal attendance is dispensed with. But section 339B provides an exception to this rule. According to this provision, where the court has a reason to believe that an accused has absconded or concealed himself to be arrested and produced for trial, the court taking cognizance may decide to carry on the trial by fulfilling some conditions (Halim, 2008, pp.252-256). In the compliance of the conditions, there are also two separate rules. One is before appearance in the court and another one is after appearing before the court or under the release on bail. If the court gets a reason to believe the accused person has absconded or concealed himself to avoid arrest or to be produced before the court, the court taking the cognizance can direct that very person to be present before the court within specified period by publishing an order in at least two national daily Bengali Newspapers having wide circulation. After the publication of such an order, if the said person appears before the court in compliance with the direction, the court may pass order for sending him to custody or may grant him bail in consideration of relevant facts and circumstances but if s/he fails to comply with the direction, the court may continue the said trial in his absence (Sarkar, 2016, pp. 202-203). And in the second case, when such a person is released on bail and absconds or fails to appear before the court after getting proper notice, such a procedure is not necessary there. After completing the aforementioned formalities, the court shall fix a date for hearing the accused under section 241A/265C of the said Code of Criminal Procedure (Hamidul Haque, 2019, pp.294-297).

Trial in absentia is also permissible in certain necessary cases tried under the *Nari-O-Shishu Nirjatan Daman Ain*, 2000. Here the Nari-O-shishu Nirjatan Daman Tribunal can exercise such a power according to the section 21 of the said Act. Pursuant to this law, Tribunal judges, rather than Judicial or Metropolitan Magistrates, are authorized to direct an accused (who cannot be arrested or who remains absconding or concealed) to be present before the Court or the tribunal. And here the tribunal will circulate this order to be present within specified time by publishing notices in at least two national daily Bengali newspapers having wide circulation. But if that very person is released on bail, such a circulation is not necessary for conducting trial in his absence but proper notice should be given to him as an element of natural justice. But in order to form such an opinion, the Tribunal must have some reasonable grounds for passing this order for ensuring justice.

Similarly, Special Tribunals constituted under the Special Powers Act, 1974 also has the authority to continue trial without the presence of the accused person if necessary. But when a Special Tribunal has reason to believe that an accused person has absconded or is concealing himself avoid arrest or his presence before the court for trial and there is no immediate prospect of arresting him, it shall, direct such a person to appear before it within specified period by publishing an order in at least two Bengali daily newspapers having wide circulation and if such a person fails to comply with such a direction, he shall be tried in his absence (Sub-section 6 of section 27(6) of the Special Power Act, 1974). The court of Judicial or Metropolitan Magistrate can issue processes of proclamation and attachment of property of the person absconded under sections 87 and 88 of the Code of Criminal Procedure (CrPC), 1898 (Ratanlal and Dhirajlal, 2007, pp. 59-60) and this rule is given in section 7 of the Special Powers Act, 1974.

Trial in Absentia is often seen in the cases tried under International Crimes Tribunal Act, 1973 and section 10A of this Act deals with this procedure. Generally, the proceedings before a Tribunal begin upon the submission of formal charges of crimes alleged to have been committed by each of the accused persons by the Chief Prosecutor, or a Prosecutor authorized by him on this behalf. Then the tribunal fixes a date for the trial of the accused. If before fixing the date of trial, it is reasonably believed to the tribunal that the accused person has absconded, it (please use the noun) may continue the proceedings fulfilling the required conditions. But here the tribunal may direct to engage a counsel to defend the accused at the expense of the government. In Bangladesh, many proceedings are going on despite the absence of the accused.

5. Dangers of Criminal Justice in Trial in absentia:

The primary responsibility of a criminal court is to hold a fair trial and the accused is always the middle body here. The trial is opportunity of the accused to defend and challenge the evidence brought against him *and* to place his fact, circumstances and arguments. In brief, it is a great opportunity of the accused to tell his version of fact of the case. That's why, international law is more careful about *in absentia* actions and this proceedings generally been not present in international law since the post-World War II. Trials *in absentia* were also forbidden in the modern international tribunals for example, the International Criminal Tribunal for the former Yugoslavia, Rwanda, the Special Court for Sierra Leone and the International Criminal Court as well. Exceptionally, these proceedings are allowed at the Special Tribunal for Lebanon which was opened in 2009 and it created significant debate.

It is argued that a trial in absentia can violate some human rights. It should also be kept in mind that if the defendant is not present at the hearing the possibility increases of someone innocent being punished; this unjust punishment can violate many human rights. For that reason, the decision makers must act more carefully in these cases to avoid making wrong decisions. Another adverse effect of a trial in absentia is that the defendant's absence may create an impression against the defendant, thus hazarding a fair trial. Accusations and decisions must be based on concrete evidences, and it should be kept in mind that any defendant absent from the trial is not necessarily guilty. For that reason, evidences must be evaluated in the usual manner in a *trial in absentia*.

In this regard, some measures should be taken to prevent unfair situations arising. First, no matter the reason why the defendant is not present in court, his or her absence must not be viewed as an indication of guilt. Moreover, in the absence of the defendant, the defense team must be present and represent the defendant. Also, with the help of a retrial, the possibility of making a faulty decision can be reduced. The main motto of international criminal justice cannot be fulfilled, at least not immediately, in the absence of the accused during trial.

6. Trial in absentia in International Legal Instruments

To be present before the court is both a right and duty of an accused for the sake of proper administration of justice. But there are many cases where the accused is deliberately absent or refuses to enter the courtroom or sometimes requests not to attend the hearings in order to perform responsibilities at home or for any other reason. So, this is a matter of great debate whether in the absence of the defendant/ accused the trial should be considered. In the history of international criminal justice, ideas on conducting trials in the nonattendance of the defendant have altered over time.

Both the International Military Tribunals (IMTs) in Nuremberg (Article 12 of the Nuremberg International military Tribunal (IMT) Charter, 1945) and Tokyo (Article 9 of the Tokyo Tribunal's Charter, 1946) recognized the in-absentia trial, though other International tribunals established immediately after the IMTs rejected this view for the accused's rights of fair trial. But the latest addition of the list of international criminal tribunals reintroduced the concept of absentia trial to avoid any miscarriage of justice. The Special Tribunal for Lebanon is the pioneer for this remarkable decision.

Though at the International Criminal Court (ICC) there is no provision for trials *in absentia*, in some situations, it has permitted the accused to be absent from the trial proceedings. Moreover, in 2013 the ICC Rules of Procedure and Evidence were amended to allow trial in the absence of the accused in specific circumstances (International Criminal Court (ICC) Rules of Procedure and Evidence (2013), Rule 134). Rome Statute, the basis for establishing the ICC has played a major role in international criminal law development by making the parties obliged to incorporate a number of international crimes into their national laws. According to this statute; genocide, crimes against humanity and war crimes are the most heinous crimes, and these should not go unpunished even the accused are absent from the trial proceedings (Kluwen, T. , 2017, pp.7-38). Article 37 of the ICC Draft Statute generally prohibits trial in absentia, but the trial chamber may order for it with human rights standards in special circumstances which may be raised deliberately by the accused or for any unavoidable cause. Escaping from the court, continuously disrupting the court, unable to be present for ill health are the main acceptable grounds. Here some conditions for ensuring fair trial must be followed to continue the trial in the absence of the accused. Here court needs to ensure that rational steps have been taken to notify the accused about the charge taken against him, and if he has no legal representative, the court will appoint a lawyer for representing him. In case of deliberate absence, the court may record the evidence and this is a matter of argument whether this evidence should be admissible in subsequent proceedings or not?

Many advocates opine that it is tough to maintain justice in international cases in the absence of the accused as cross examination can be taken as the necessity in the matter of security issue. But it may also hamper the justice if the accused escapes by using the benefit of the prohibition on absentia trial through halting an investigation or trial.

Trial in absentia might be recognized by ensuring judicial and prosecutorial efficiency as more time consumption is a barrier for a successful prosecution. It

is well-established that delays during investigations or trials are costly and may decrease the expertise of witness testimony by a consequence of memory loss or death as well as elapse of time may demolish and fabricate important evidences. Some commentators advise for taking evidences or examinations of the accused by videoconference to maintain fair trial. Later on, after the amendment of the International Criminal Court (ICC) draft statute, the Rome Statute recognized this trial to continue when the accused disrupts the proceedings and also limited this authority to "exceptional circumstances". This statute entitles the accused to video conferencing and instruction from legal representatives during his/her absence when other reasonable alternatives are inadequate and for only such a duration strictly required (Brown, 1999). The Extraordinary Chambers in the Courts of Cambodia (ECCC) and the Special Court for Sierra Leone (SCSL) allowed the trials in absentia in a limited way only when an accused made an initial attendance and afterward failed to appear.

In the United states Legal System, to be present in one's own trial is a right of the defendant but here are also some exceptions as the United States Supreme Court opined that trials could take place in the absence of the accused if initially present at the commencement of the proceedings but at some occasions is 'voluntarily absent' and it is considered as informed waiver of the defendant. This may happen if the court decides to remove the defendant for interrupting court proceedings continuously and the Federal Rule of Criminal Procedure 43 also follows this view. It is a curse on judicial progress to halt a trial after commencement than to start it in delay. In spite of having many controversies, American jurisprudence also recognized the trial in absentia in exceptional circumstances mainly to ensure proper justice (Brown, 1999).

United Nations Human Rights Committee and Council

The UN Human Rights Committee ("UNHRC") opines that the accused or his legal representative must have the right to pursue all available defenses in diligent ways and to challenge the conduct of the case seems to be unfair. But when trials in absentia are held for justified reasons, strict observance of the rights of the defense should be maintained (UNHRC, 2006). Though there is no clear observation for justified reasons, some circumstances can be highlighted for this purpose including the main ground as the administration of justice. Provided that here the diligence must be strong and formal not merely a regular process like circulation in daily newspapers rather it must be an actual notice ensured by the state. The trial court must be convinced that the accused has known the charges and is willfully avoiding the participation in the trial (International Bar

Association (IBA) Report, 2016) .*The Prosecutor v Hassan Habib Mehri* (2013) case tried by the Special Tribunal of Lebanon is a glaring example where proof of steps for giving actual notice was provided to the tribunal. Among these, personal summon could not be served as he or his adults family members were unavailable in his residence. After that wide circulation was provided in renowned national and international newspapers along with media release and other formalities. Having completed all relevant procedures, when the tribunal was convinced with the documents of his absconding, the trial of Mr. Mehri was held in his absence.

From the aforementioned discussions, we can summarize that UNHRC decided to meet some safeguards before pursuing '*trial in absentia*'. The first one is necessary for the proper administration of justice and to ensure this condition the prosecution must show that all actual ad (???) possible steps have been taken to inform the accused of the charges and proceedings. Necessary steps include to summon the accused persons in a timely manner and to inform them earlier about the date and place of their trial and to request their attendance along with alternative services. The prosecution must establish that the defendant has actual knowledge of the proceedings and failure to show this knowledge results in a violation of the defendant's right to be present (Herath, 2014, pp. 2-12).

International Covenant on Civil and Political Rights

The International Covenant on Civil and Political Rights (ICCPR) provides an accused with some rights as a minimum guarantee of fairness including the right of access to the courts in cases of determination of criminal charges and trying in his own presence (Article 14(3) (d), ICCPR,1966).It also provides with self-defense by himself or through legal representative. This guarantee prohibits any distinctions regarding access to courts and tribunals irrespective of their race, color, sex, language, religion, political or other opinion, national or social origin, property, birth or other statuses. This right of equal access to a court is applied to the access to the first instance procedures and not to appeal or other remedies. This right of being present before the court must be applied according to the provisions of domestic law of the particular state party. Paragraph 3 of the same article permit proceedings in the absence of the accused in some circumstances for the sake of the proper administration of justice, For example; the accused person himself fails to be present but such trials are only compatible when the accused will be fully-informed of their charges and summon has been served in properly and timely manner to request their attendance. Paragraph 7 ensures retrial of a case if the person convicted in absentia requests for that.

European Convention of Human Rights, 1950

Like UNHRC, The European Convention on Human Rights (ECHR) also contains similar provisions regarding trial *in absentia*. Among other minimum fair trial rights, Article 6(3) ECHR provides for the right of a person to be notified of the nature and cause of the accusation brought against him in detail, on time, and in a language which he understands. This convention also provides the accused person to be defended by himself or through a legal representative. *Colozza v Italy (1985)* is an example where the object and purpose of article 6 of the European Court of Human Rights (ECHR) was exclusively explained.

The ICCPR, ECHR as well as no international or regional human rights treaty clearly prohibits trials in the absence of the accused rather the common accord regarding the right of an accused to be present at his or her trial is not absolute and may be subject to certain and limited exceptions (Global Rights Compliance, 2017).

7. Lessons for Bangladesh from the Comparative Insights

From the view of international perspective, some constructive ideas might be implemented for trial *in absentia* in the legal system of Bangladesh. Though the International Covenant on Civil and Political Rights provides that an accused is entitled to be tried in his presence, both the HRC and the ECHR have permitted trials in the absence of the accused under very limited conditions. Jurisprudence holds that it is not *per se* contrary to the right of fair trial, if the following safeguards are maintained; (i) Proper notice of the proceedings must be given to the accused and the proper notice means to assure that the accused has actual knowledge of the charges brought against him. (ii) The appointment of the counsel for effective representation is the right of an accused who has been tried *in absentia*. The Counsel should efficiently perform his duty beyond undue influence and pressure. Required legal and logistic support must be provided to the defense team and even the state will fix defense counsel when it is not fixed by the accused. Defence office of the Special tribunal for Lebanon also urges for the ethical obligations of the counsel for ensuring fair trial where the defense counsel themselves need to set the scope of representation as well as to undertake the basic requirements for a fair trial *in absentia*. (iii) The right to retrial is another precondition for allowing the trial in the absence of the accused where he is provided with the opportunity to obtain fresh determination of the charges on merit including both question of law and fact. Human Rights Committee (HRC) refers the retrial in the form of a trial of first instance while the European Court of Human Rights (ECHR) understands it as an appellate review, *de novo*, based on the facts. Here some relevant questions may arise about which institution is

responsible for retrial as well as funding regarding this. We conceive this view from the retrial of an accused under Special Tribunal For Lebanon (STL), The International Criminal Tribunal for the former Yugoslavia (ICTY) and the International Criminal Tribunal for Rwanda (ICTR) as there are provisions for review judgments even 10 or 20 years after the trial held (Wisner, C. 2015).(iv) If an accused waive his or her right, this waiver must be clear and voluntary. And his or her counsel should be given a chance to defend him or her. As a proof of acquiescence the person can produce a document like Affidavit with authentic sign and can pledge not only the renunciation of his or her right to take part in proceedings and to defend himself- or herself, but also indicate awareness of the consequences of his or her waiver(Huqe, 2015, pp.574-580).

Moreover, from the decision of the international tribunals and courts i.e. ICTY, STL; following points can be perceived for a fair trial in absentia in Bangladesh; (i) Trials *in absentia* should be seen as part of a continuing process, including the bringing of an accused into the custody of the court, witness protection and reparations for victims. (ii) Persistent attention should be paid to intermediate procedures which refer to the inquiries, fact – finding as well as the examination of evidence in the absence of the accused, stopping short of a full criminal trial and verdict. (iii) The sort of circumstances in which a trial may commence or continue in the absence of the accused and required cautionary measures should be pointed out. (iv) Well established precedents in international criminal and human rights law should be implemented in applying the required safeguards of notice, effective representation and the right to re-trial on the basis of practical circumstances. For example, defense office as an organ of a court should be established for legal and logistic support to attain the counsel's effective representation of the accused *in absentia*. Besides, necessary funding and forum should also be taken into consideration. (v) As trials *in absentia* present particular challenges for counsel, necessary efforts should continue to harmonize the ethical considerations for counsel in international and national contexts. (vi) Additional deliberation should be given to the role of victims, to support their understanding of the minutes and limitations of the trial. Planning for reparations to victims should be incorporated. (vii) In comparison to Special Tribunal for Lebanon (STL), in Bangladesh death penalty is insisted in absentia trial which is criticized by human rights organization

8. Conclusion

From historical perspective, trial in absentia of the accused was prohibited but later on it was permitted in some international tribunals for fair justice as delayed justice may deny its fairness. UDHR, ICCPR, American legal system etc.

recognize the trial in absentia when it is really necessary for the sake of justice. In Bangladesh criminal laws including Code of Criminal Procedure, 1898, the Special powers Act, 1974, International Crime tribunals recognized trial in absentia if needed for continuing justice but through this study we may add some suggestions in respect of an international arena. Informing the accused through proper and reasonable notice, right to retrial, sufficient and efficient legal representatives on behalf of the accused should be maintained for ensuring justice. Sometimes the accused waives his right to be present before the court and so it can be concluded that trial in absentia can be allowed very cautiously and judiciously to a limited extent. Necessary lessons traced in this paper will enrich the traditional system of trial in Absentia in Bangladesh. If these measures are implemented through the policy makers, the study will be a helpful one in the field of criminal justice.

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- Article 6 of the European Convention on Human Rights (ECHR) says, "that a person 'charged with a criminal offence' is entitled to take part in the hearing".
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Rohingya Settlements in Ukhia and Teknaf and its Impact on the Ecosystem

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Abstract: *This paper explores the Rohingya refugee crisis in Ukhia and Teknaf areas where at least one third of the total refugee population inhabits. Eleven environmental impacts were reported to have been aggravated by the influx of Rohingya of which five impacts were on ecosystems, i.e. natural forests; protected areas and critical habitats; vegetation; wildlife; and marine and fresh water ecosystems. These ecosystems on the southern coast of Bangladesh play a significant role in the environment but Rohingya rehabilitation camp and their living style are causing serious ecological and environmental changes on the areas resulting in adverse bearings on life and livelihood of the people. This paper also attempts to analyze the ecological imbalances as caused by the influx of Rohingya people in Ukhia and Teknaf. Evidences of environmental degradation due to the indiscriminate Rohingya refugee settlements in these areas, findings of the problems and recommendations for the solutions of the issues will of a special focus of the study.*

Keywords: *Keywords: Rohingya; Ukhia and Teknaf; Refugee Camps; Ecosystem; Environmental Hazard and Livelihood.*

1. Introduction

The effects of the refugee crisis on environment of the host community and natural resources have become an emerging topic for refugee studies. Rohingya refugees from Myanmar settling in Ukhia and Teknaf upazilla (sub-districts) of Cox's Bazar district located in the southeast part of Bangladesh have visible environmental impacts. Their prolonged stay may have an irreversible effect on the ecosystem and environment (Shepherd, 1995). As of December 2017, there were nearly 860,000 Rohingya refugees in Cox's Bazar district, of whom

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671,500 Rohingya have fled Myanmar since August 2017 and have taken their shelters in various refugee camps in Ukhia and Teknaf (UNOCHA, 2017). Since 1970s, Rohingyas have been coming to Bangladesh from Myanmar due to their prosecution there and a total of 212,518 of them were recorded to be living in Cox's Bazar area for years before August 2017. Almost one million of them are Rohingya Muslims who are currently taking shelters in these areas (ISCG, 2018).

Teknaf and Ukhia areas, according to the 2011 population census, has a total population of 264,389 and 207,379 respectively and the Rohingya population there is more than 1 million which continues to increase. Being adjacent to Myanmar border, majority of the refugees are residing in Teknaf and Ukhia areas (Imtiaz, 2018). They often encroach upon the protected topography, vegetation and wildlife sanctuary which play a vital role in the region's climate adaptation and mitigation process. The influx of refugees in to these areas has a visible effect on local forests and exacerbated human and wild life conflicts. Significant national and community forestry areas, which were already under pressure, have been further degraded due to the refugee influx, reducing the opportunities drastically. The government has allocated 3,000 acres (1,200ha) to a new camp (UNDP Bangladesh and UNWOMEN Bangladesh, 2018), the allocated site is close to the protected area, which is at a high risk from the influx of refugees. Key areas of biodiversity, such as Teknaf Wild life Sanctuary (TWS), Himchari National Park (HNP) and Inani Protected Area (IPA) are likely to be depleted and forest resources are likely to be over-exploited, symptoms of which are already evident. TWS is home to a large population of Asian elephants from Bangladesh as well as several other endangered species that are currently in regular contact with refugees (Dekrout, 2018). So the movement of thousands of people and the setting up of refugee camp can have an adverse impact on local ecology and the health of neighboring communities (Lynch, 2002).

2. Review of the Context

2.1 Introduction to the Study Area

Ukhia and Teknaf areas show varied types of land with wet, forested, hilly, coastal and flat land found together within a small stretch of land. The Aman rice variety and betel leaf are the two main agricultural crops cultivated in those regions. Forest growth is driven by the physiography and by the climatic conditions of these regions. Although forests make up 41% of the region, it is declining fast due to the widespread anthropogenic and natural phenomena. Bengalis, Rakhais, Chakmas and Rohingyas live side by side in this region. The

principal livelihood activities in these areas include the collection of forest resources, fishing, agriculture and business. Most of these areas consist of hilly areas that are not susceptible to flood. Most households in Ukhia and Teknaf have homestead vegetation (Mosleuddinet al., 2018).



Figure 1: Natural condition of Ukhia and Teknaf
Source: Tanvir, 2018



Figure 2: Refugee sites human settlement and built environment.



Figure 3: 'Makeshift' site conditions



Figure 4: Refugees are cutting forest, collecting firewood and collecting timber for construction. Source: Shuvo, 2018

2.1.1 Human livelihood, settlement and built environment: Local people live harmoniously with nature, though the population is putting some pressure on the environment. Sea fishing and cultivation of betel nuts and betel leaf (pan) are the primary means of production in the region and the majority of households within the zone are engaged in one way or other in these activities. The land price is rising due to the investors who emphasize tourism facilities in these areas but there are no prospects for most households in the region to be engaged economically with the growing tourism (UNDP Bangladesh and UN WOMEN Bangladesh 2018).

The word 'makeshift site' is used locally to differentiate the improvised sites of

Kutupalong and Leda from the officially recognized refugee camps of Nayapara and Kutupalong. In fact, 'makeshift sites' are also official refugee camps but not recognized and designated as such for political reasons. The "Makeshift Site" of Kutupalong is older in Ukhia and was built in 1995 with a population of just under 36,000. Leda was founded in 2008 with over 14,000 inhabitants and is located in Teknaf. Both sites have incredibly harsh living conditions. Refugees are living in plastic sheet rooftop comprising mud/bamboo wall shacks of around 3m x 3m. Usually the houses of 5 to 6 households sleep on the ground floor with no partitions. A corner of the house is used for storing fire wood and cooking area that fills the small space with smoke. The government regulates both the makeshift sites and each upazila is regulated by Camp Management Committees (CMC) and Block Management Committees (BMC) (UNDP Bangladesh and UN WOMEN Bangladesh 2018).

2.2 Risk Evaluation on Ecosystem

2.2.1 Wildlife and Vegetation: The Ukhia and Teknaf forests are covered with tropical evergreen and semi-green forests dominated by Garjan in deep and shady valleys. The region still has rich biodiversity, particularly in the protected areas. The forests here have deteriorated or being cleaned up over the past two decades due to the intrusions. The Teknaf Wildlife Sanctuary (TWS) forest coverage has reduced from 3,304 hectares to 1,794 ha, i.e. by 46% from 1989 to 2009. From 6,263 ha to 7,824 ha, the shrub forest type has increased by 25%. In spite of deforestation, the area still contains rich biodiversity including mega-faunas such as the Asian elephant (*Elephas maximus*) and many different bird species. It has been reported that more than 50% of the country's wildlife species live in the Ukhia, Teknaf, Inani and Himchari forests under Cox's Bazar South Forest Division (UNDP Bangladesh and UN WOMEN Bangladesh 2018).

Land Cover Class	Area, ha	Area, %	Biomass, kg/ha
Crop	14,238.2	24%	ND
Mangrove	312.0	1%	ND
Non-vegetated or water	7,445.4	12%	NA
Residential	10,217.8	17%	NA
Plantations and orchards	1,469.3	2%	155,384
Shrub dominated area	548.7	1%	2
Shrub dominated forest	21,438.2	36%	2
Hill forest	4,662.7	8%	17,003
Total	60,332.3	100%	

Table 1 : Land Cover Classes in the Area of Influence (AoI).
Source : UNDP Bangladesh and UN WOMEN Bangladesh 2018

2.2.2 Teknaf Wildlife Sanctuary (TWS): TWS was built to concentrate on the protection of the Asian Elephant, more than a hundred of which were observed in the sanctuary. Infiltrations including the Rohingyas have been blocking elephant corridors. Over the past 50 years, human as well as natural factors have caused degradation of vegetation in the area of influence (AoI). The 1991 Rohingya flow and other infiltrations greatly reduced the forests of Ukhia and Teknaf. The settlements and homestead forests were elevated by 52.6 percent within the TWS boundary. In 2012, 10 percent of the area was covered by natural forests under the TWS and the remaining was covered by shrubs with a few scattered trees. The Nishorgo Support Project (2006) describes eight TWS habitats that support rich biodiversity. They are: high forests; plantations; grasslands and bamboo; wetlands; coastal mudflats and vegetation of mangroves to the east of the Naf River; sandy beaches to the west of the Bay of Bengal; cliffs and steep slopes; and fields and settlements. Biodiversity in the TWS includes several endangered species in Bangladesh and habitat has been declared critical. More than half of the country's mammalian species were housed in the TWS in the 1990s. This region has lost many wildlife species due to anthropogenic pressures over the past three decades (UNDP Bangladesh and UN WOMEN Bangladesh 2018).

2.2.3 Himchari National Park (HNP): HNP, declared in 1980, is one of Bangladesh's main protected areas, covers 1729 hectares and is part of Cox's Bazar South Forest Division. There are 56 reptile species, 13 amphibian species, 286 bird species, and more than 100 species of trees, shrubs, grasses, canes, palms, ferns and herbs in the park. Many anthropogenic factors that have been intensified by the Rohingya influx affecting the biodiversity of the park as merchants illegally collect bamboo and firewood from this forest and sell them to the Rohingya refugees (UNDP Bangladesh and UN WOMEN Bangladesh 2018).

2.2.4 Inani National Park (INP): The INP covers an area of 7,700 ha of reserve forest that falls under an evergreen and semi-green tropical forest region. It contains both the Inani and Ukhia forests. Although the Inani forest area was historically rich in flora and fauna, it is mainly herbs, sungrasses, shrubs and bushes that make up the present vegetation. Over the last three decades, the forest has shrunk from 70% to less than 30%. In the INP, there are 443 plant species from 93 families including rare ones. One of the rarest trees still present in this forest is a gymnosperm tree genus, *Banspata* (*Podocarpus nerifolia*). The plant species include 140 (32% of the total), 85 (19%) shrubs and 151 (34%) plants, 60 (13%) tremblers and seven (2%) epiphytes. 29 species of amphibians belong to six families in this forest. There are 58 species of reptiles, mostly rare, of which 5 are turtles and tortoises (9%), 21 are lizards (36%), and 32 are snakes

(55%). It maintains 253 species of bird of which 195 are residents (77%) and the remaining 58 are migratory (23%). Among the birds, 44 species (23%) are very rare, and 68 (35%) are uncommon. In this habitat, a total of 39 mammals, mostly rare, are found. Though there is no direct effect on the Inani protected area (IPA) of the current Rohingya influx, there are evidences of illegal bamboo and firewood extraction from the IPA and selling to the Rohingya community (UNDP Bangladesh and UN Women Bangladesh 2018).



Figure 5: Refugee sites present scenario



Figure 6: Impact on plantation due to refugee settlement

2.2.5 Forestry in Ukhia and Teknaf: In Ukhia and Teknaf, both the host and the Rohingya populations compete for firewood as a source and as an economic activity. The arrival of a large number of Rohingya resulted in the clearing of forests due to the lack of space to accommodate them: an estimated 8,000 acres of reserved forest in Cox's Bazar were destroyed (Hasan, 2020). It is not just the Rohingya inflow that has stressed the forest. The betel leaf, a leading industry in the area, contributes significantly to deforestation. As the crop requires shade, locals cut wood to create shade structures, and often cut trees to create space for betel leaf gardens to expand. Deforestation raises the likelihood of landslides during monsoon rainfall (April-September) as it changes soil characteristics and deteriorates soil quality, reducing soil stability. The hilly areas where shelters

were built are thought to have been more vulnerable after the influx (ISCG, 2017).

2.3 Findings from Review:

The current state of Teknaf and Ukhia has been shaped by both deforestation and reforestation affecting ecological balance. These activities have not only decimated wildlife habitats, but also have changed the composition of plant species and have been responsible for the deterioration of ecosystems in the region. Due to the Rohingya settlement, the large-scale conversion of forests as well as agricultural land has had a significant effect on flora and fauna and habitats. The construction of the Rohingya shelters in the forest areas has led to the deforestation (UNDP Bangladesh and UN Women Bangladesh 2018). The region, now a degraded forest land, includes three Ecologically Critical Areas (ECAs), the western coastal zone of Teknaf Peninsula, the HNP and the TWS. The habitats of such environmental assets and biodiversity have a very fragile ecosystem. The supply of surface and ground water is minimal, and salt water on both sides of the inflow area can only sustain a few crops and trees. Local people rely on small streams of water coming from the hills/terrains in the region (UNDP Bangladesh and UN WOMEN Bangladesh 2018).

3. Methodology

3.1 Study Approach

It is basically a desktop study and the required data was mostly collected from secondary source and projected by software simulation. The level of significance of potential risks on ecosystem includes both the potential impact (e.g. if the risk occurred) and the likelihood (e.g. the likelihood of the risk occurring) for each identified risk. Analysis has been done by Arc GIS 10.3.1 through NDVI. By buffer tool, impacts on ecologically critical area have been shown.

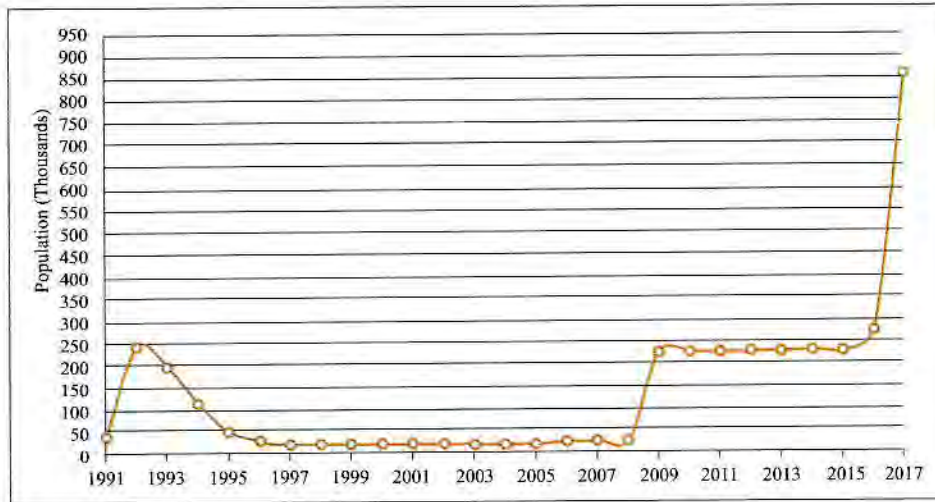


Figure 7: Number of Rohingya refugee influxes in Bangladesh from 1991 to 2017 (cumulative number of refugees including pre-influx population). Source: Data for the period of 1991-2016 were retrieved from United Nations High Commissioner for Refugees (UNCHR), and refugee population data for the year of 2017 were obtained from Inter Sector Coordination Group (ISCG)

The main goal of this study is to determine the vegetation cover change of Teknaf peninsula using Normalized Difference Vegetation Index (NDVI). Since Landsat-8 images were used in this study, band 5 was taken as Near Infrared (NIR) and band 4 was taken as Red. For calculations of the NDVI data we used the formula. $NDVI = (Band\ 5 - Band\ 4) / (Band\ 5 + Band\ 4)$. NDVI values range from -1.0 to 1.0. Areas of barren rock, sand, or snow usually show very low NDVI values (for example, 0.1 or less). Sparse vegetation such as shrubs and grasslands or senescing crops may result in moderate NDVI values (approximately 0.2 to 0.5). High NDVI values (approximately 0.6 to 0.9) correspond to dense vegetation that is found in temperate and tropical forests or crops at their peak growth stage (USGS 2018). This technique is applied for comparison of vegetation cover changes from multiple dates of NDVI imageries. All the pixels with NDVI values above 0.1 were counted for calculating total areas of vegetation.

3.2 Study Area Delineation

The Rohingyas have been arriving into Teknaf and Ukhia from across bordering Myanmar. Of a total of 14,602 ha of the forest, TWS is 11,615 ha. (Moslehuddin and et al. 2018). The influx of Rohingya refugees makes the population almost double in Ukhia and Teknaf, and this is shifting the ecological balance of the areas (UNDP Bangladesh and UN WOMEN Bangladesh 2018).

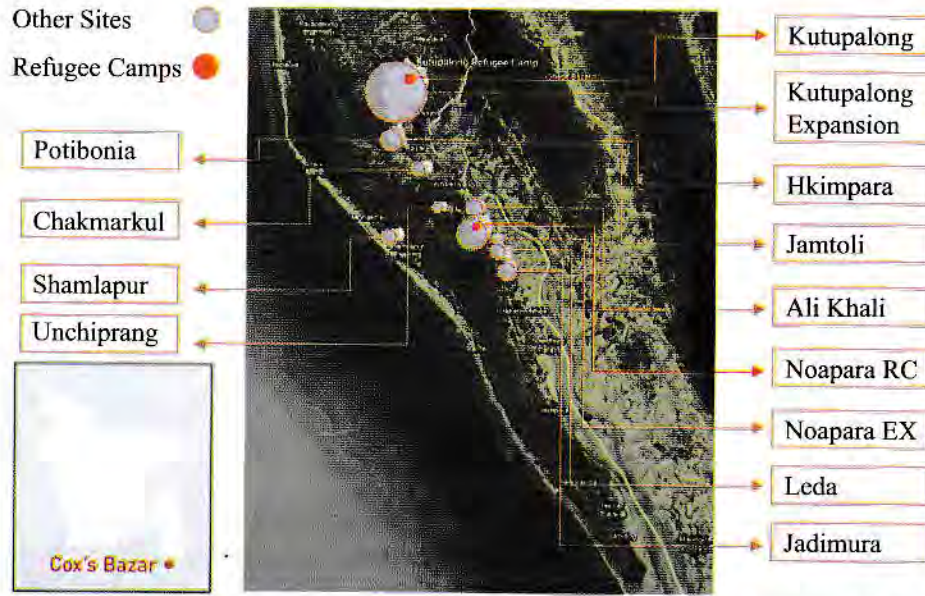


Figure 8: Refugee sites by population and location type Source: ISCG,2020 & Arc GIS 10.3.1

Location	Population before 25 Aug	Post-25 Aug Influx	Total Rohingya Population
Ukhia & Teknaf	212,518	621,066	859,808

Table 2: Total Population of Rohingya in Ukhia & Teknaf
Source: UNDP Bangladesh and UN WOMEN Bangladesh 2018 & ISCG, 2020

Forests have a crucial part to play to protect local people's livelihood. However, 41% of the region contains forests (Moslehuddin and et al. 2018). The collection of firewood from natural forests and community forests is an important source of income for Rohingya as well as for the host community. Therefore, there is a competition and there are high tensions over the firewood (UNDP Bangladesh and UN WOMEN Bangladesh 2018).

The habitat of the environmental assets and biodiversity has a very fragile ecosystem. Due to the huge influx of Rohingya population which is around 909,207 (ISCG, 2019), the flora and fauna species are seriously damaged and the construction of shelters for the Rohingya built in the forest areas of Teknaf peninsula has contributed to forest degradation and deforestation. Historically, the main uses of the land in the area have been small-scale agricultural crop production, betel nut/leaf cultivation and other domestic agro forestry, but at

present the main uses of the land include the construction of hotels and resorts, the growth of urban and tourist facilities, agriculture, aquaculture and salt farming and human settlements are very risky for the ecosystem of Ukhia and Teknaf (UNDP Bangladesh and UN WOMEN Bangladesh 2018).

4.Impact Assessment on Ecosystem

4.1 Forest degradation Data collection and Analysis

The whole forest land in the AoI is assessed as 26,600 ha. Setting up of large make shift camps in the Kutup along, Balukhali and other areas has made a substantial direct impact on the available forest resources in the Ukhia range. There is a forest dilapidation of 30-40% due to the ongoing deforestation process. In the Teknaf Range the influx has also impacted some of the plantations in the buffer zone and has reportedly started impacting the core zone of the TWS as well (UNDP Bangladesh and UN WOMEN Bangladesh 2018).

4.1.1 Direct Impact on Plantations: The Rohingya makeshift settlements have taken over a total of 3,713 acres (1,502 ha) of forest land under the Ukhia, Whykong and Teknaf forest ranges. 1,960 acres (793 ha) of natural forest land and 1,753 acres (709 ha) of plantation area have been encroached upon. More than 1,500 social forestry participants have lost their privileges with the loss of social forest plantations, as almost all the plantations have been cleared for temporary settlements in different years (UNDP Bangladesh and UN WOMEN Bangladesh 2018).

Upazila	Location of the Rohingya camp			Encroached forest area			
	Forest Range	Forest Beat	Rohingya camp	Legal status	Social forest plantation (acre)	Natural forest (acre)	Total forests (acre)
Ukhia	Ukhia	Thainkhali	Balukhalidhala	Reserve	152.70	135.3	288
			Tasnimakhola		177.5	214.5	392
			Mokkrarbill	Reserve and protected	271	236	507
			Hakimpara, Jamtoli Bagghona, Sofiullah Kata			92.5	108.7
		Ukhiarghat	Balukhali	450		359	809
		UkhiaSadar	Kutupalong	535		793	1,328
Teknaf	Whykong	Roikong	Putibunia	Reserve	0	65.2	65.2
		Whykong	Karantoliy-Chakmarkul	Protected Reserve	74.20	1.0	75.2
	Teknaf	Mochuni	Noyapara	Protected	0	31	31
			Leda		0	16	16
Total, acres					1,752.9	1,959.7	3,712.6
Total, ha					709	793	1,502

Table 3: Impact of Rohingya on forest land of the Cox's Bazar South Forest Division
Source: UNDP Bangladesh and UN Women Bangladesh 2018

Table 3: Impact of Rohingya on forest land of the Cox's Bazar South Forest Division
Source: UNDP Bangladesh and UN Women Bangladesh 2018

4.1.2 Fuel wood and Bamboo Use

It was observed that various stakeholders including Rohingya families have confirmed during field reconnaissance that Rohingyas have long been gathering firewood from natural and community forests. Adequate information is not available to quantify the forest damage incurred, but it is clear that continuing demand for fuel wood will eventually force Rohingyas into more aggressive interference with natural forests and plantations. A quick social survey in the Leda and Sofiullar Kata Rohingya camps reveals that the average firewood intake of the Rohingya family is 151.07 ± 47.25 kg/month, with the average number of family members at 7.07 ± 2.54 (Table 4). They claim firewood is mainly purchased from the local market, but it is observed and reported that all firewood had been collected from nearby forests. Bamboo was used for the construction of settlements of 63.54 ± 11.99 culms/family with a fresh weight of 358.93 ± 85.52 kg/family (UNDP Bangladesh and UN WOMEN Bangladesh 2018).

Forest Range	Forest Beat	Fresh biomass			Total oven-dry biomass (tons/ha)
			BBD (tons/ha)	Total biomass (tons/ha)	
Ukhia (n=34)	Thaingkhali	587.72 ± 157.44	96.35 ± 26.53	684.07 ± 180.51	256.53 ± 67.69
Teknaf (n=34)	Muchuni	333.48 ± 127.33	63.70 ± 22.79	397.18 ± 150.07	148.95 ± 56.28
Carbon					
		ACD (tons/ha)	BCD (tons/ha)		Total carbon (tons/ha)
Ukhia (n=34)	Thaingkhali	110.2 ± 29.52	18.07 ± 4.97		128.26 ± 33.84
Teknaf (n=34)	Muchuni	62.53 ± 23.88	11.94 ± 4.27		74.47 ± 28.14

Table 4: Biomass and carbon loss from the plantation due to the makeshift settlements in the Ukhia and Teknaf forest range
Source: UNDP Bangladesh and UN WOMEN Bangladesh 2018

4.1.3 Forest Degradation Data and Analysis

Garjana (*Dipterocarpus*, spp.), dominated tropical always-green and forests in deep valleys and shaded hills, is covered by forest lands of the Ukhia and Teknaf Upazilas (IUCN Bangladesh, 2002). Most parts of the hills re-occupied by sungrass, herbs and shrubs have been denuded by human activities. The protected areas still houses a wealth of biodiversity.

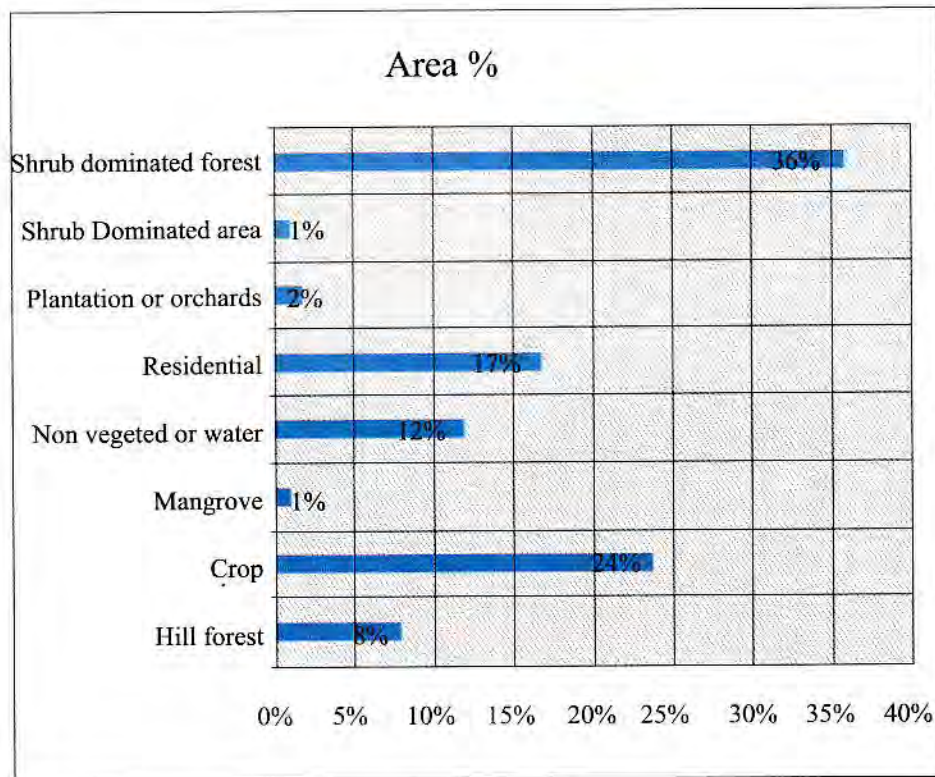
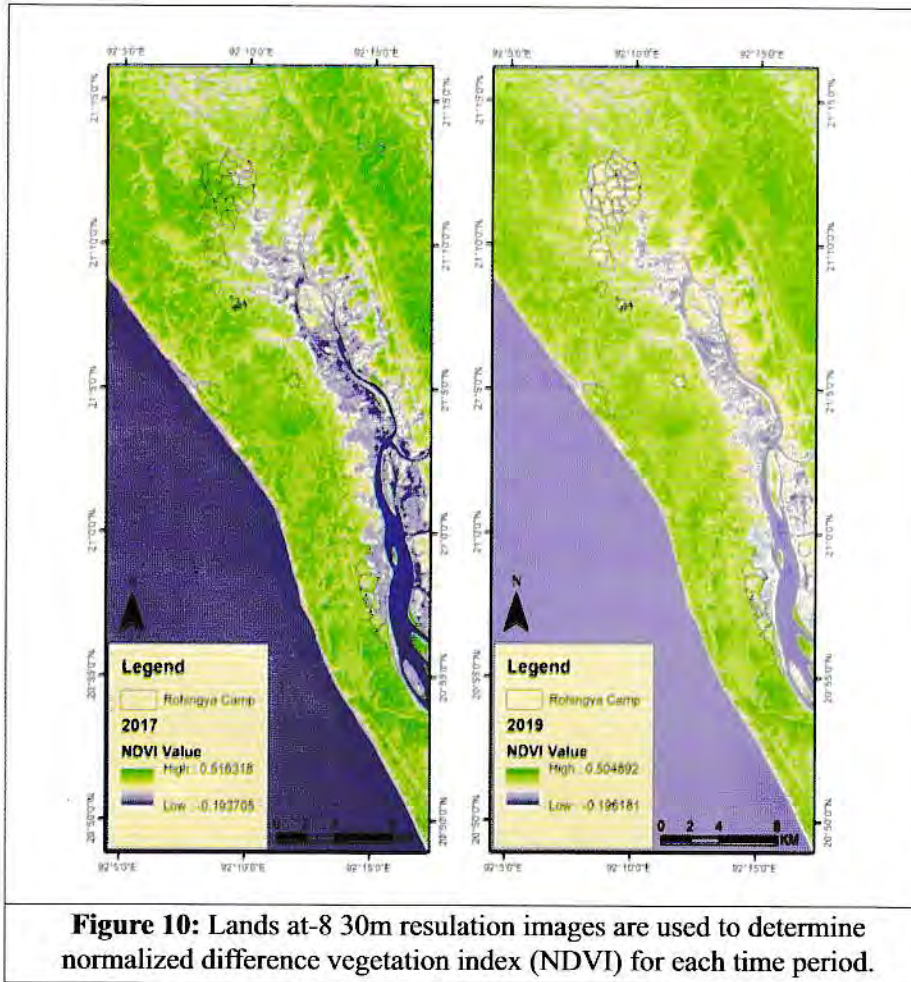


Figure 9: Land Cover Classes in the AoI. Source: UNDP Bangladesh and UN Women Bangladesh 2018

The forest areas in Ukhia and Teknaf have been substantially degraded or cleared in the last two decades. TWS forest coverage was reduced by 46 percent from 3,304 ha to 1,794 ha between 1989 and 2009. The forest shrub type rose by 25% from 6,263 ha to 7,824 ha. (Arannayk Foundation. 2013) A total of 3,713 acres (1,502 ha) of forest lands under the Ukhia, Whykong and Teknaf forest range have been taken over by the Rohingya makeshift settlements. (Cox's Bazar South Forest Division, November 2017). Clearly there is an ecological imbalance.



Lands at satellite images were analyzed to assess the extent to which forest degradation had taken place over time. A Lands at image consists of 30×30 m cells. Each cell is assigned with values measured by multiple sensors. Lands at image cells within the study area were processed and categorized according to the values of the normalized difference vegetation index (NDVI). After collecting Landsat-8 (30m resolution) images of two different time period 1st February 2019 and 26th January 2017 from Earth Explorer, had imported into Arc GIS 10.3.1 and with the help of spatial Analyst Tool, using Raster Calculator where the NDVI rules is used that is -

$$\frac{\text{NIR} - \text{red}}{\text{NIR} + \text{red}} \quad [\text{Here Band 4 (B4) and Band 5 (B5) has been used}]$$

The NDVI is expected to be a float number. So the formula is - $\frac{\text{B5} - \text{B4}}{\text{B5} + \text{B4}}$

From the calculation, NDVI value has been found. The value represents the degradation rate. Major camp expansion and loss of forest resources surrounding the Kutup along camp occurred mainly in a southwestern direction and forest degradation and its expansion are observed between December 2017 and December 2019.

4.2 Ecologically critical areas Data Collection and analysis

4.2.1 Data Collection

The field covers the camp sites and all camps within 5 km and 10 km buffers (figure 5). Baseline data refers to the 2015 overall AoI coverage (see figure 10). Table 6 reveals that about 50% of forest land is in a buffer of 5 km, while 95% of forest land is in a buffer of 10 km. In other words, nearly all of the forest land remaining in the AoI would be cleared if the effect covers the entire 10 km buffer. The collection of fuel wood, if it continues unabated, would undoubtedly have a major effect on TWS, the proposed Inani National Park and potentially Himchari National Park. While situated further north of the AoI stream, the Himchari National Park may be affected by fuel wood collectors if they run out of resources near the camps (UNDP Bangladesh and UN WOMEN Bangladesh 2018).

Cover class	Baseline, ha	Footprint, ha		
		Camps	5 km buffer	10 km buffer
Crop	14,238	203	6,720	12,694
Mangrove	312	0	113	237
Non-vegetated or water	7,445	3	3,080	6,116
Plantations and orchards	1,469	101	798	1,362
Residential	10,217	344	4,744	8,499
Shrub dominated area	548	3	284	516
Shrub dominated forest	21,438	626	12,457	20,837
Hill forest	4,662	9	1,651	4,368
Total	60,332	1289	29,848	54,632

Table 5: Land Cover Classes in the AoI **Source:** UNDP Bangladesh and UN WOMEN Bangladesh 2018

Cover class	Baseline, ha	Impacted part of baseline areas		
		Camps' footprint	Footprint of 5 km buffer	Footprint of 10 km buffer
Plantations	1,469	7%	54%	93%
Shrub dominated area	548	1%	52%	94%
Shrub dominated forest	21,438	3%	58%	97%
Hill forest	4,662	0%	35%	94%
Table 5: Land Cover Classes in the AoI Source: UNDP Bangladesh and UN WOMEN Bangladesh 2018				

Protected Area	Baseline, ha	Projected 5 km, ha	% to Baseline	Projected 10 km, ha	% to Baseline
TWS	11,615	6375	55	11615	100
Inani National Park	7,770	1862	24	7264	93
Himchari National Park	1,729	0	0	0	0s
Table 7: Available biomass and fuel wood demand in the AoI Source: UNDP Bangladesh and UN WOMEN Bangladesh 2018					

Up to 7% of the total areas occupied by plantations and orchards and 3% of the forest dominated by shrubs in the AoI have been cleared up to set up provisional Rohingya camps. More than 61 % of natural forest plantations and remnants will potentially be destroyed and converted to shrub land in the long term due to the influx of natural forests (figure 6). Vegetation clearance and forest land loss have a major effect on landscape diversity, the abundance of vegetation and the diversity of organisms. The improvised camps have a major effect on biodiversity and food scarcity, and nocturnal, metaturnal, crepuscular and diurnal wildlife are threatened by diminishing ecosystems and breeding ground disturbances. More than 67 % of mammalian wildlife is terrestrial, and about 63.8 % of this amount depends on forests as a habitat. Because of the ever-decreasing natural forest area, aquatic species is also under serious danger (UNDP Bangladesh and UN WOMEN Bangladesh 2018).

4.2.2 Impacts on Ecologically Critical Areas

The TWS and HNP are the most important protected areas in Bangladesh. The biodiversity of the park is threatened because of Rohingya influx. In spite of the degradation, this forest area still houses rich biodiversity including megafauna like the Asian elephant (*Elephas maximus*) and many different bird species. It has been confirmed that more than 50% of the country's wildlife species are living in

the forests of Ukhia, Teknaf, Inani and Himchari within the Cox's Bazar South Forest Division (MLGRDC, 2019). The internationally endangered Asian Elephant (*Elephas maximus*) is 'critically endangered' in Bangladesh. In the Cox's Bazar Forest Division, host and Rohingya populations are invading their habitats, and both resident and migratory elephants face a continuous shrinking of their habitats and food supply (UNDP Bangladesh and UN WOMEN Bangladesh 2018). Asian elephants (elephants have caused 11 deaths), as well as several other species are threatened which now regularly come into contact with refugee communities (Dekrout, 2018).

By using Arc GIS 10.3.1, critical area map has been developed where the protected areas (The Teknaf Wildlife Sanctuary (TWS) and Himchari National Park) are shown. Then a buffer map (2km and 5km) has been generated in Arc GIS 10.3.1 where affected zone has been highlighted. With the help of this Analysis tool, for creating Buffer 2km and 5km distances had been added. Approximately 50% of forest land lies in the 5km buffer and 95% of Forest land is in the 10km buffer.



Figure 11: Ecologically Critical Area Map (generated by Arc GIS 10.3.1 & Photoshop)



Figure 12: Affected Zone Area Map (generated by Arc GIS 10.3.1 & Photoshop)

4.2.3 Land Slide and Flood Risk

The extensive loss of groundcover vegetation and hill cutting loosens the soil and can result in soil erosion, sedimentation, siltation and landslide which will become especially more evident in the rainy season. Low-growing shrubs and grasses - which previously served to protect waterways, reduce surface heat, slow the runoff of rainwater, and bind loose soils, are no longer present in most parts of the camps.

5. Recommendations

01. Currently, there are no policies from the government for rehabilitation housing for Rohingyas in Ukhiya and Teknaf. As a result, refugees develop their own housing by cutting trees and clearing sites/forests resulting in the imbalance of ecosystem of those areas. So, it is necessary to develop an idea of housing which will not hamper the existing forest and its ecosystem. From this perspective, the idea of this study proposes a concept of housing that will be designed as a temporary settlement for this area in an organized manner covering minimum areas consisting of local materials. The proposed temporary refugee housing would take care of local topography and ecology of Ukhiya and Teknaf.



Figure 13: Conceptual vernacular settlement for Rohingya in Ukhia and Teknaf by considering local natural ecosystem

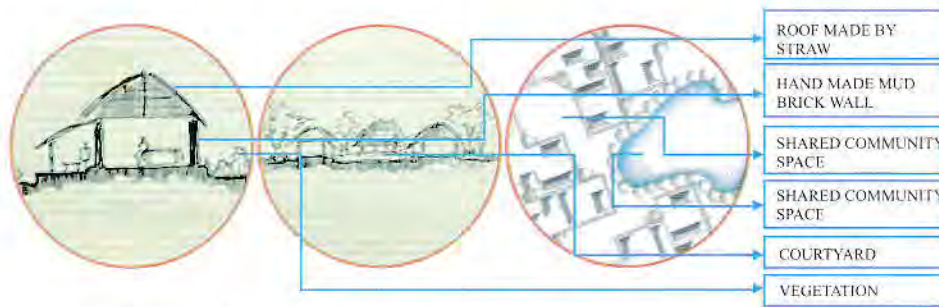


Figure 14: Vernacular architecture with shared community space

From those points of view, the idea is to develop small cluster settlements in this area which will contain courtyard, spaces and ample vegetation to merge with the surroundings. Materials of those structures will be handmade mud block and roof will be made from straw and bamboo. This settlement will interact with the existing forest and thus wild life and ecosystem will be affected. When Rohingya people will leave the place, the mud block and roof straw will mix with the land and go back to its original environment.



Figure 15: Conceptual visualization of housing type

02. More trees need to be planted on barren land.
03. Present social forestry, forestry and agro forestry culture may be revived and extended to include the refugees.
04. Wood supplies and mining; managerial access from natural forests and town forests to fuel wood will be restored.
05. Creation for the next five years of a detailed forestry/plant development plan.
06. The TWS, the HNP and the INP should be effectively secured, and acquire proposed resources for implementing the national resource use provision in the protected areas. Strict prohibition of wood cutting, felling, degradation of trees, and the harvesting of fuel wood from forests.
07. Develop a conservation plan for biodiversity, including the creation of critical and natural habitats in the region.

08. Establish INP as soon as possible and ensure that funds and services are available for its service.
09. Make sure that protection of Rohingya from elephant intrusions with combined fences (trees, bamboo and solar powered electrical fences near the camp areas in Ukhia and Teknaf).
10. Track the movement of wildlife, hold sensitization camps in order to prevent conflict between animals and people regarding resources and areas and enforce Wildlife Protection Act.

6. Conclusion

The heavily degraded and apparently protected ecosystems will soon undergo a significant conversion. Further degradation and reduction of the habitat's ability to maintain sustainable populations of its native species and losing its ability to sustain its ecosystem will significantly adapt. If the 'ecological impacts' of the refugee influx are not addressed in time, some irreversible damage to ecosystem may take place. The disturbed landscape will have a reduced capacity for healing and for environmental sustainability. It is important to protect natural and critical habitats, though the immediate impact of disturbances in the ecosystems is not immediately evident. The adverse symptoms of Rohyinga refugee influx in Ukhia and Teknaf are already visible. Forest degradation has been a long-standing problem in the area which is exacerbated by the influx of Rohingya. The mitigation of this crisis relates to the host communities and the Rohingya refugees in using patterns of land and the resources. Settlers need guide lines to respond to the context for sustainability. The overall ecosystem of the area is largely dependent on the local natural forest area. So, relevant authorities should work together to chalk out guidelines to protect the forest and organize them according to the time tested indigenous patterns of living with nature as suggested for the sake of valuable natural ecosystem of Ukhia and Tenaf.

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Spatial Analysis of Road Accidents Using GIS: A Case Study for Sylhet District, Bangladesh

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Abstract: Traffic accident is a serious problem around the world, particularly for a developing country like Bangladesh. In many cases, road accidents lead to loss of lives. This study was accompanied for Sylhet. Sylhet, a holy and tourist pole area of Bangladesh, faces severe road accidents. Total number of 198 accidents occurred between 2016 and 2018 in Sylhet district with 168 fatal accidents. As a result, 220 persons died while 606 were injured. This study identifies the highly compacted accident sections as well as proposes to establish the sections which claim well organised road management considerations. The highly compacted accident sections were identified by using Geographic Information System. Kernel density estimation was done by ArcMap10.3. The high crash-prone zones are concentrated on Tajpur-Osmaninagar road (Balaganj), Lalabazar, Chondipul (Dakshin Surma), Amberkhana-Airport road, Amberkhana to Temukhi point (Sylhet-Sunamganj road), Tilagar-Surmagate (Tamabil road) of Sylhet district. So, these segments require more safety attention to reduce road accidents.

Keywords: Traffic accident, Road safety, High-density accident segments, GIS, Kernel density analysis

1.0 Introduction

Road accident is one of the major root causes of the unnatural losses of human beings all over the world. According to WHO (Media Centre, 2017), every year at least 1.35 million people die by road accidents. WHO passed the information that, low and middle-income countries have a very high fatality ratio on road (around 93%). Although they are not developed, they are using the maximum number of the world's vehicles (around 60%) according to WHO. As a growing city, accident situation is increasing day by day due to some reasons and unavailability of the accident information of Sylhet district is one of them. Major

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road accidents are caused by heavy trucks from Volaganj in Airport road and Amberkhana-Temuki point on Sylhet-Sunamganj road of Sylhet. In addition, substantially accidents occur in Majaortila and Tilagar of Sylhet due to heavy and loaded trucks from Jaflong. Drivers' reckless driving and pedestrians' carelessness and road geometry are also influential factors for a road accident. GIS knowledge can be used as a way to picture accident data and can be used for analysis of accidents as well. A very few studies have been done about road traffic accident analysis using GIS in Bangladesh and Sylhet. Although there are some works done for Sylhet without GIS, for instance by Banik et al. (2011) on road accidents of Sylhet. They also worked on safety. Accident rate analysis in Sylhet district using SPSS method for highway safety evaluation was conducted by Mulk et al. (2016). In this study Kernel density assessment was done to determine high-density road accident sections of Sylhet district road network. Kernel density analysis for accidents (serious and others) were done to evaluate the most risky portion of the road network.

KDE is known as the often used technique in studying the first-order effects in accident investigation due to its easiness with less implementation difficulties and discussed by Bailey et al. (1995). KDE is frequently used to notice traffic accidents prone areas. Hashimoto et al. (2015) conducted a study by using Kernel density estimation and they worked on traffic accident density estimation models. Thakali et al. (2015) used Kernel density estimation and kriging methods. They focused on crash hotspots. KDE and K-means grouping was conducted by Anderson et al. (2008). They made profile of road accident hotspots. Dangerous road locations using GIS on Dhaka-Chittagong 'N' road was conducted by Alam et al. (2013). This paper characterized the locations as well. Shafabakhsh et al. (2017) worked on urban traffic in Iran. Understanding of spatial crash patterns helps to identify the segments having a greater number of crashes. It is also useful to relate with other similar settings.

The results could play a vital role to identify risky roadway segments that need more attention from transportation authorities, drivers and pedestrians. In this study, ArcMap 10.3 software was used. It has a precise ability to show and study spatial forms of accidents. Categorization of black spots for accidents on roads is an imperative matter for road security.

The objective of the research work has given below:

- This study aims to identify the high crash-prone accidents segments for Sylhet district by Kernel density analysis

2.0 Methodology

To determine the high-density accident segments of Sylhet district road network

which connects all the Upazilas, traffic accident data for the years 2016, 2017 and 2018 were considered from a popular and reliable divisional newspaper “The Daily Sylheter Dak”.

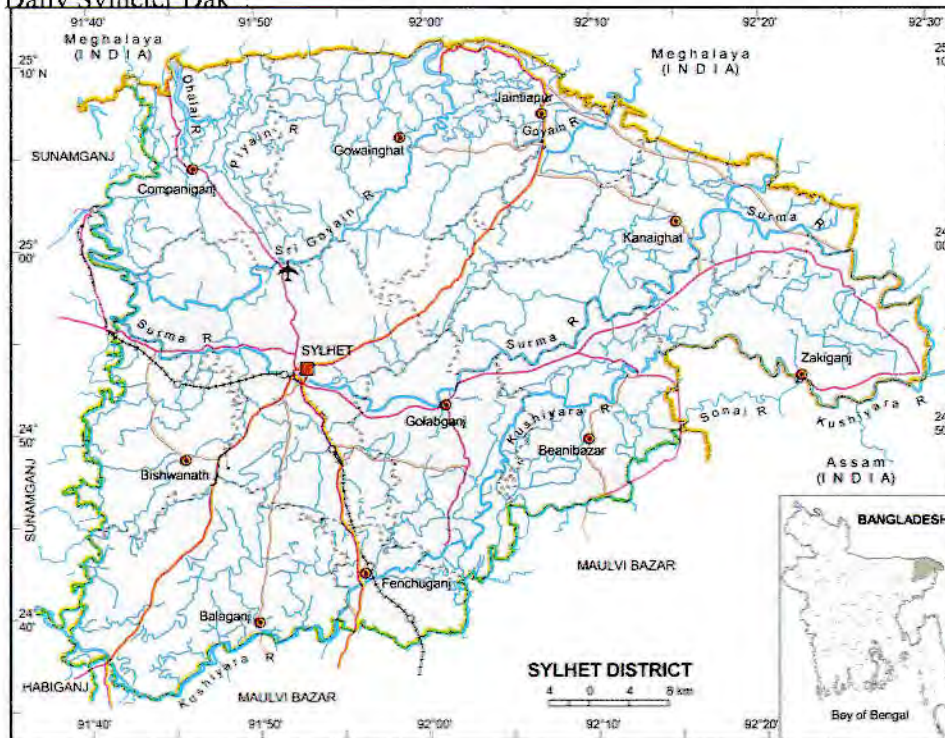


Figure 01: Map of the study area

Sylhet district (Figure 01, Source: Wikipedia) is located in north-eastern part of Bangladesh. It has an area of about 3490.40 square kilometres (Source: Wikipedia). It is a holy and tourist pole of Bangladesh. Latitudes of Sylhet is within 24°36' and 25°11' north where longitudes is within 91°38' and 92°30' east (Source: Wikipedia).

The collected data of accident could not be used directly with its original format, so it was indispensable to rearrange the data for analysis. At that time excel sheets (attribute tables) were made according to the requirements and needs of the analysis. The steps are followed for the determination of high-density accident segments (Figure 02).

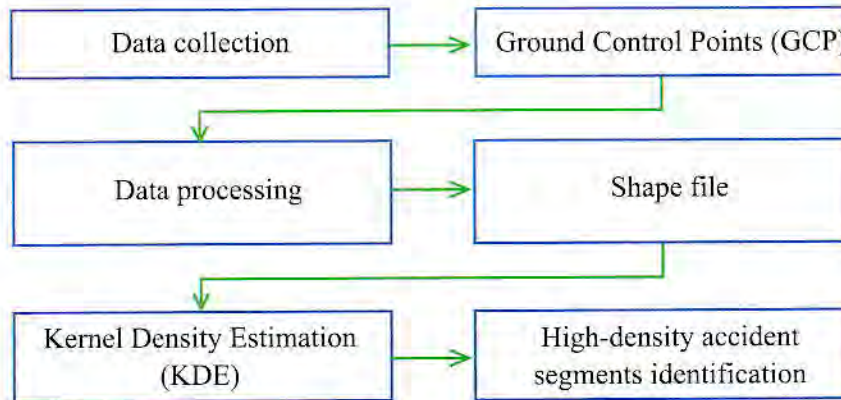


Figure 02: Steps for High-density Accident Segments Identification

KDE analyses the event's density and its application finds out the high-density accident segments. KDE analyses the spreading of accident points as well where the following equation plays a vital role (Fotheringham et al., 2000).

$$f(x, y) = (1/nh^2) \sum_{i=1}^n K\left(\frac{d_i}{h}\right) \quad (1)$$

In equation (1),

$f(x, y)$ is used for density estimation of a specific locality (x, y) .

n is used as the quantity of observations.

h is used for Kernel size.

K is used for Kernel function.

d_i is used as distance which lies between the (x, y) and the position that is used for i th observation.

3.0 Results and Discussions

Accident clustering can prove an effective job for accident analysis. In this paper Upazila-wise accidents were analysed to sort out the most vulnerable Upazila of Sylhet regarding accidents. It can give the authority a clear idea on which Upazila they could focus first considering road accidents.

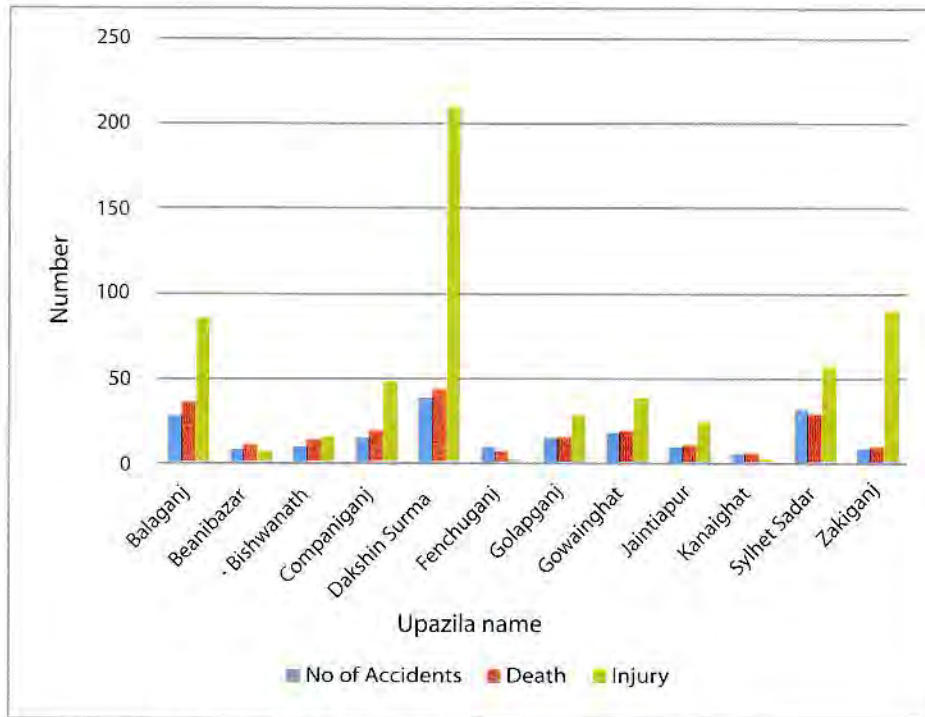


Figure 03: Upazila-wise accidents (2016 to 2018)

Figure 03 has represented the number of accidents with death and injury for Upazilas. Accidents were everywhere. Balaganj, Sylhet Sadar and South Surma (Dakshin Surma) were vulnerable considering the fatalities and after effects of accidents (physical) compared with other Upazilas. But South Surma (Dakshin Surma) Upazila was the most vulnerable one considering the accidents with death and wounds compared with other Upazilas of Sylhet district.

Journal of Business, Society and Science, Volume-08, Issue-01 (January 2021)

Evaluation of causes of accidents is vital to get solutions. There were several reasons of accidents such as,

- o Over speeding
- o Over taking
- o Careless and reckless driving
- o Bad road condition
- o Alcohol
- o Pedestrian carelessness
- o Over loading
- o Sleeping
- o Turning

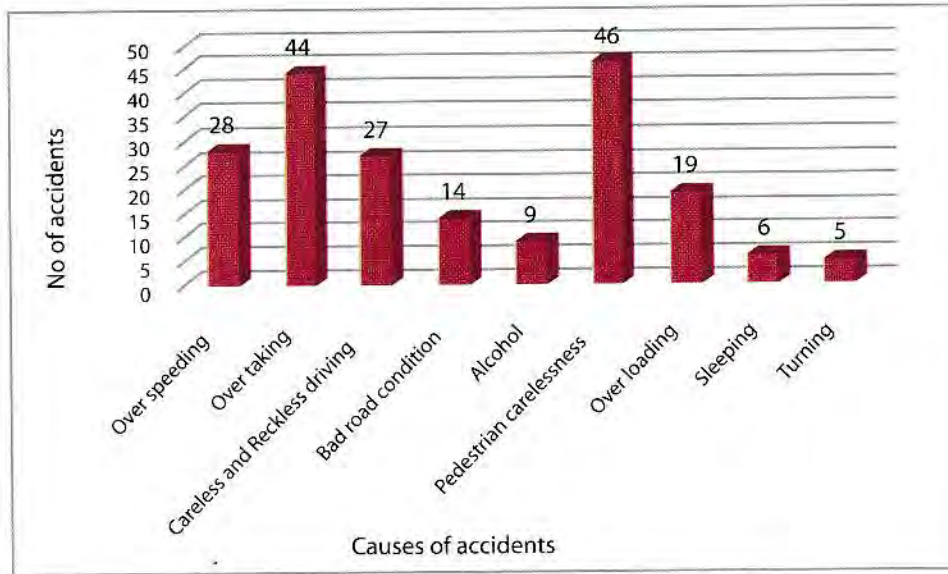


Figure 04: Causes of accidents (2016-2018)

Figure 04 has provided the information about the causes of accidents in the Sylhet district for 3 successive years (2016, 2017 and 2018). Overtaking tendency of vehicles and pedestrian's carelessness were the leading causes of road accidents in Sylhet district.

Accident can happen anytime and at any place. Every accident has three dimensions such as accident without any injury or death, accident with only injury and accident with both injury and death. Figure 05 was plotted based on Kernel density level leading to number of accidents for Sylhet district where data were taken from 2016 to 2018.

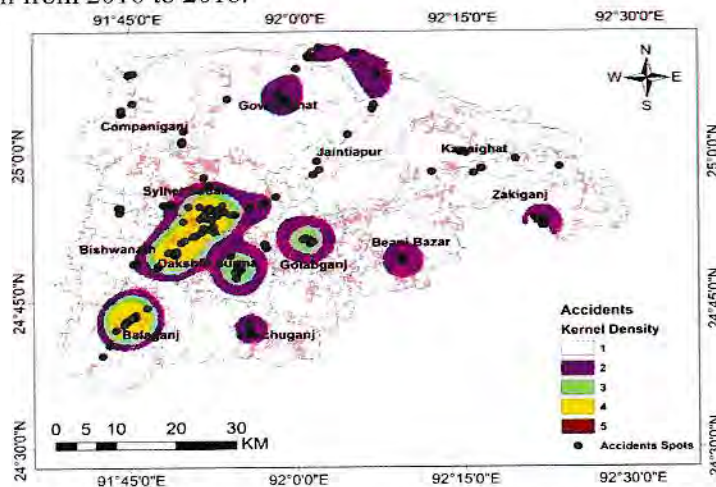


Figure 05: Kernel density analysis considering accidents (2016 - 2018)

Figure 05 has shown the Kernel density analysis considering accidents (2016 - 2018) in Sylhet district. From the result it was established that the high-density accident-prone areas were on Dhaka-Sylhet highway; Tajpur-Osmaninagar road (Balaganj), Lalabazar, Chondipul (DakshinSurma), Amberkhana-Airport road, Amberkhana to Temuki point (Sylhet-Sunamganj road) and Tilagar-Surmagate (Tamabil road) were in the list. And, the very high-density accident-prone area was Tajpur to Osmaninagar road (Dhaka-Sylhet Highway) of Balaganj Upazila. So, these segments have required more safety attentions.

Accidents leading to death are of the highest concern regarding the effects of accidents. But in road accidents, the ratio of death is very high. Every year thousands of people die in roads due to some negligence of drivers, people and authority. It can be easily minimized by a proper road management.

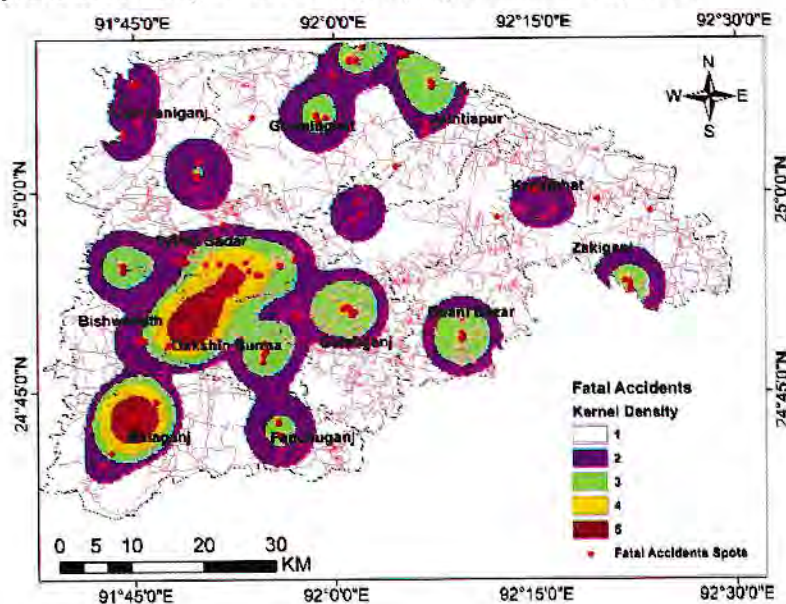


Figure 06: Kernel density analysis considering accidents leading to death (2016 - 2018)

Figure 06 has exposed the Kernel density analysis (accidents) leading to death from 2016 -2018 in Sylhet district. From the outcome it was settled that the high-density accident-prone areas based on death issue were on Dhaka-Sylhet highway; Tajpur-Osmaninagar road (Balaganj), Lalabazar, Chondipul (DakshinSurma), Amberkhana-Airport road, Amberkhana to Temuki point (Sylhet-Sunamganj road), Tilagar-Surmagate (Tamabil road) in Sylhet SadarUpazila and before Golapganj Bazar in Golapganj Upazila. So, these areas have required more safety attention to reduce fatality.

Injury after an accident is a common phenomenon. But people, authority and media do not concern on injury issue after an accident, they only focus on death issues although some injuries can destroy a family both economically and mentally. So, proper focus on road injuries is a crying need.

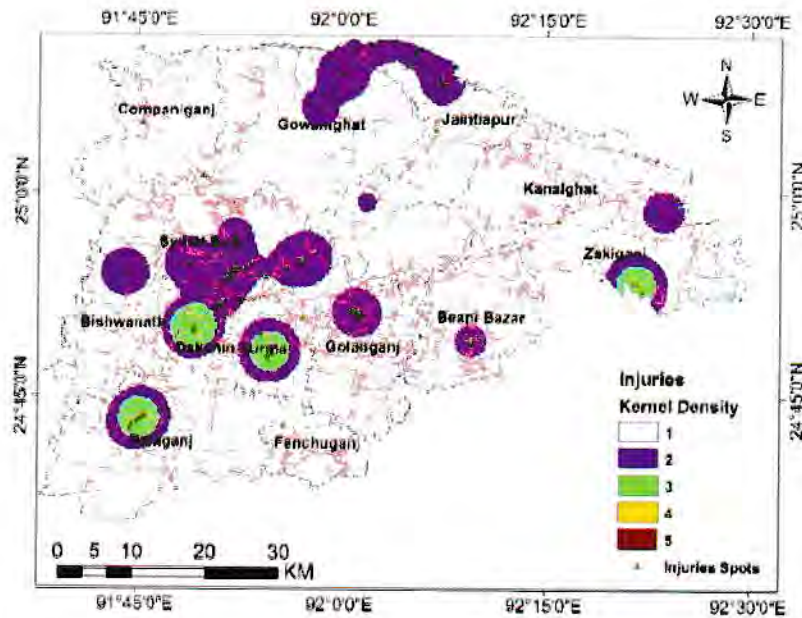


Figure 07: Kernel density analysis considering accidents leading to injury (2016 - 2018)

Figure 07 has uncovered the Kernel density analysis considering accidents that results injury (2016 - 2018) in Sylhet district. From the outcome, it was documented that the very high-density accident-prone area in term of injury was Lalabazar (Shatmail) in Dakshin Surma Upazila. So, this area requires more safety attention.

4.0 Conclusion

Accident analysis is a continuous process. By analysing a specific area which comprises a well-used road network can lead an accident free zone after providing the necessary solutions to road problems. In this paper the reasons of accidents as well as vulnerable road networks were identified where deaths and injuries were considered.

The major findings were given below:

- o South Surma Upazila was the most vulnerable compared with other Upazilas
- o Overtaking tendency of vehicles and pedestrians' carelessness were the

leading causes of road accidents in Sylhet district

- o The very high-density accident-prone area was Tajpur to Osmaninagar road (Dhaka-Sylhet Highway) of Balaganj Upazila.
- o The high-density accident-prone areas based on death issue were on Tajpur-Osmaninagar road (Balaganj), Lalabazar, Chondipul (Dakshin Surma), Amberkhana-Airport road, Amberkhana to Temuki point (Sylhet-Sunamganj road), Tilagar-Surmagate (Tamabil road) in Sylhet Sadar Upazila and before Golapganj Bazar in Golapganj Upazila.
- o The very high-density accident-prone area in term of injury was Lalabazar (Shatmail) in Dakshin Surma Upazila

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