

The Impacts of Jhum on Hilly Area (Rangamati, Khagrachari)

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This Thesis Report is presented to the Faculty of Science and Information Technology Daffodil International University in Partial Fulfillment of the Requirement for the Degree of Bachelor of Science in Environmental Science and Disaster Management.



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CERTIFICATE APPROVAL



I am pleased to certify that the Thesis Report “The Impacts of Jhum on Hilly Area (Rangamati, Khagrachari)” prepared by **Kornia Chakma** bearing **ID NO: 163-30-145** of the Department of Environmental Science and Disaster Management is approved for Presentation and Defense.

Kornia Chakma work as an independent researcher under my supervision. She completed the work as partial fulfillment of the requirement for the DEGREE OF BACHELOR OF SCIENCE IN ENVIRONMENTAL SCIENCE AND DISASTER MANAGEMENT, which has been examined and hereby recommended for approval and acceptance.

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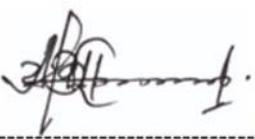
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DECLARATION

I hereby declare that, this research project has been done by me under the supervision of **Dr. A.B.M. Kamal Pasha, Associate Professor & Head, Department of ESDM**, Daffodil International University. I also declare that neither this research project nor any part of this research project has been submitted elsewhere for award of any degree or diploma.

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DEDICATION

I dedicate this paper to my parents and they are my best friends and without their effort I may not be here today. Also, the dedication is for my teachers, my classmates & juniors, without them I couldn't have made it.

ACKNOWLEDGEMENT

On the very outset of this report, I would like to extend my sincere & heartfelt obligation towards all the personages who have helped me in this endeavor. Without their active guidance, help, cooperation & encouragement, I would not have made headway in the project.

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At last but not least gratitude goes to all my friends who directly or indirectly helped me to complete this project report.

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ABSTRACT

We surveyed about the Jhum cultivation of Langadu upazila , Rangamati and Babuchara, Dighinala in Khagrachari. Collected the data based on interview. This survey was conducted from August 2020 to December 2020. The objectives of this survey is to assess the impact of Jhum cultivation, the factors of environment degradation and review the existing crops production system in hilly area and their performances. About 30 persons are taken to interview and collected many data based on the survey. Data is collected in three parts, general information of Jhum owners, assessing the existing crop production system explaining the detail information about the Jhum cultivation. Ages, educational qualification, types of Jhum production system and use of the fertilizers, were analyzed to the green roofs. Most of the respondents are < 50 years but all the respondents are uneducated and it is observed that 10 persons out of 30 were educated.

Shifting cultivation is not, at this point an appropriate land use both ecological and monetary points of view, and there is have to supplant such land use steadily with elective locally reasonable land-use frameworks (Knudsren and Khan, 2002). Step by step populace pressure is expanding in the bumpy one of Bangladesh and because of land shortage the nearby individual's can't move to somewhere else. Jhum cultivation is currently practicing on perpetual territory in the cases soil has losing its ripeness and Jhum cultivator's can't getting enough money crops thus it having hard to job for Jhum cultivator just by Jhum cultivation. The reduction in neglected period has prompted the crumbling of faunal and microbial living beings, top soil moisture and land corruption because slicing furthermore consuming during the time of substantial precipitation. Slope ranchers hence face a grim future with Jhum cultivation. So in this current circumstance the Jhum cultivators may be receive to social ranger service program as an elective wellspring of pay for vocation just as to expand woods spread in the Chittagong Hill Tracts.

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CHAPTER 1: INTRODUCTION

CHAPTER 1

Introduction:

This paper presents the customary and current harvest creation frameworks with their effects on climate in slope environments of Bangladesh. Chittagong Hill Tracts (CHT) cut and-consume farming, a sort of swidden or shifting cultivation in hilly region privately known as Jhum chash has been perceived as means food production system for ethnic minorities, to be specific Chakma, Marma, Tripura, and so on. For quite a long time, the ethnic minority networks have been practicing Jhum cultivation and this term has likewise been embraced in fishing, hunting and harvesting of timberland items. Jhum cultivation and woodland are as yet focal job player to the conventional social orders as their essential wellsprings of food, safe house, medication and different items and administrations (Ahmed and Gabby, 1996).The personal connections between the ethnic minority and the slope cultivating framework have advanced their ethnobotanical information through ages (Khisa, 1997a; 1997b).

The focus of my thesis is to show how Jhum Chas influence the environmental degradation in hilly region.

Jhum has extensively declined lately yet at the same time a prevailing area use framework in the bumpy territory and has been practicing by neighborhood indigenous gatherings of CHT for quite a long time (Khisa and Mohiuddin, 2015). Numerous examinations on CHT demonstrated that short-revolution in moving cultivation for yearly editing instantly affects extreme food creation limit of the grounds and climate (Bala et al., 2010; Rahman et al., 2012; Rahman et al., 2014).

Shifting cultivation and its related flames pulverized around 2/3 of the already existing timberlands of CHTs (Farid and Husain, 1988), which has quickened soil disintegration (Shoaib et. al., 1998). While it was an ecologically reasonable land use in the past when populace pressure was low (Nye and Greenland, 1960), it has progressively become a naturally contradictory land use framework with the shortening of decrepit period credited to expanding populace pressure, low interest in agribusiness and helpless administration privileges of timberlands in the CHTs (Knudsen and Khan, 2002). Shifting cultivation practice not just affects the soil of the cultivated land, but also surrounding environments of such cultivated land. Various researchers and the overall population. think about shifting cultivation as crude, in reverse, inefficient, useless, and exploitative just as the reason for far and wide ecological corruption (Thomas, 19)

This paper attempt to examine the impacts of practicing and harvesting system of the indigenous people in CHT.

1.1.Objectives

1. To study the existing crops production situation in hilly areas and their performances.
2. To identify the factors of environmental degradation.
3. To identify the impacts of Jhum cultivation on environment.

CHAPTER 2: LITERATURE REVIEW

CHAPTER 2: LITERATURE REVIEW

I have reviewed and collected some important information from relevant scientific articles, journals, thesis paper, relevant report, studies conducted by governmental organization. These are described below.

Most shifting cultivators in Chittagong Hill Tract experience food deficiencies differing from three to a half year out of every year, and they rely upon woodland items to satisfy their means prerequisites (DANIDA, 2000; Sutter,2000). Similarly, the pay from moving development likewise decays (Huq, 2000). Accordingly, moving development is not, at this point an appropriate land use from both the ecological and financial viewpoints, and there is need to supplant such land utilize step by step with elective locally reasonable land-use systems(Knudsen and Khan, 2002). development. With the fast development in populace, the neglected period has been decreased to 3-4 years, permitting almost no an ideal opportunity for soil recovery. The decline in decrepit period has prompted the crumbling of faunal and microbial creatures, top soil misfortune, and land debasement because of slicing and consuming during the time of hefty precipitation. Slope ranchers along these lines face a distressing future with Jhum development. So in this current circumstance the Jhum cultivators may be receive to social ranger service program as an elective type of revenue for job just as to build timberland cover in the Chittagong Hill Tract of Bangladesh. Moving development related combustible flames have pulverized practically all the peak vegetation in the region (Brammer, 1986; Khan and Khisa, 1970). Subsequently, 37% of the complete timberland of Chittagong Hill Tract has been annihilated over the long haul (Farid and Hossain, 1988).

Every year, the disintegrated soil from all the Jhum fields in Chittagong Hill Tract does around 4309 tons of nitrogen alongside different supplements (Gafur, 2001). Deforestation and soil disintegration have antagonistically influenced soil nature of backwoods lands in Bangladesh (Shoaib et al., 1998). It is assessed that around 1 million ha of land has been corrupted because of moving development (Sfeir-Younis and Dragun, 1993). Most moving cultivators in Chittagong Hill Tract experience food deficiencies differing from three to a half year out of every year, and they rely upon woods items to satisfy their means necessities (DANIDA, 2000; Sutter, 2000). Moreover, the pay from moving development likewise decays (Huq, 2000). Along these lines, moving development is not, at this point an appropriate land use from both the ecological and monetary viewpoints, and there is need to supplant such land utilize bit by bit with elective locally reasonable land-use frameworks (Knudsen and Khan, 2002).Shifting

development has likewise been steadily changing into escalated sorts of land use in various pieces of African nations, for example, Kenya, Nigeria, Rwanda and Tanzania (Cleaver and Schreiber, 1994; Tiffen & Martimore, 1994).

Ongoing examinations, notwithstanding, have zeroed in on the effects of jhum on woodlands, soil and the climate. Specialists report that jhum is a significant factor in the deforestation in CHT that quickens soil disintegration (Borggaard et al., 2003; Gafur et al., 2003; Shoaib et al., 1998). Deforestation and soil disintegration influence soil quality (Shoaib et al., 1998) and cause land debasement, which alongside abbreviated decrepit periods and expanded populace pressure has discouraged harvest yields and compromised the jobs of ancestral individuals (Rasul et al., 2004). Reports by improvement organizations (for example CARE, 2000; DANIDA, 2000) guarantee that jhumias experience food deficiencies fluctuating from three to a half year a year. These investigations distinguished the issues of Jhum that affect woodlands and the climate.

CHAPTER 3: METHODOLOGY

Methodology: Methodology is a system of ways of doing, teaching or studying something. It plays a vital role for analyzing data. Without analyzing we can't know about the study area.

For this research some software like Google Earth Pro for identify deforesting land, Statistical software (SPSS), EXCEL, mapping software (Arc GIS 10.2.1) for land mapping, city maps are used. Also used a structured questionnaire, structured discussion form, voice recorder and camera etc. My methodology that I followed to prepare my report is given below-

3.1. Methodology Diagram

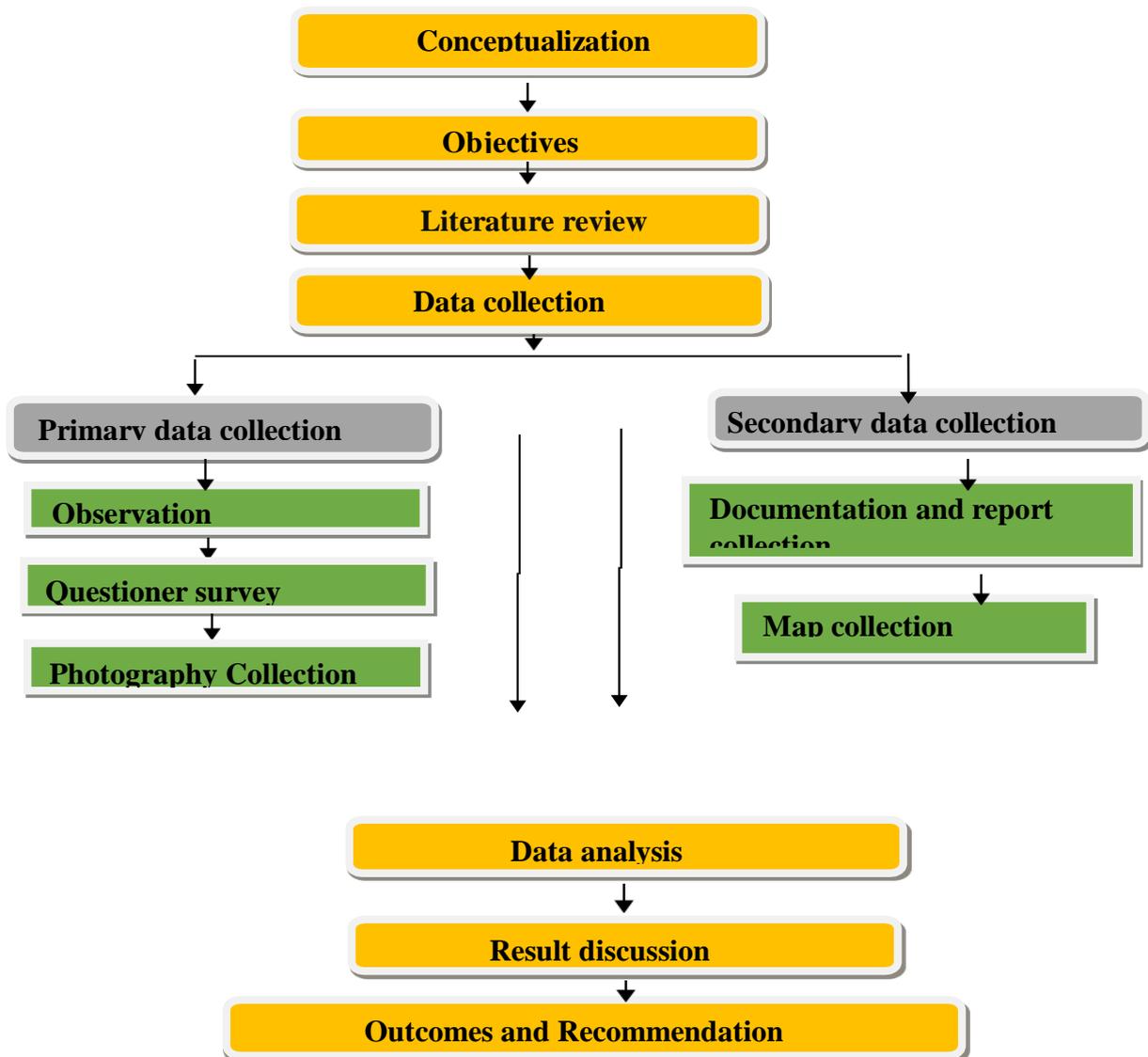


Figure 1: 3.1.1. Methodology of the study

3.2. Study Area: The selected area of this research site of this project is Langadu Upazilla, Rangamati (Langadu,Rangamati district) 'area 388.5 sq km, located in between 22°48' and 23°06' north latitudes and in between 92°05' and 92°19' east longitudes), and Babuchara, Dighinala in Khagrachari (Dighinala Upazila (khagrachhari district) area 694.12 sq km, located in between 23°04' and 23°44' north latitudes and in between 91°56' and 92°11' east longitudes.) A map of Langodu Upazila, Rangamati is shown on figure 02 and Babuchara,, dighinala,, Khagrachari is shown in figure 03

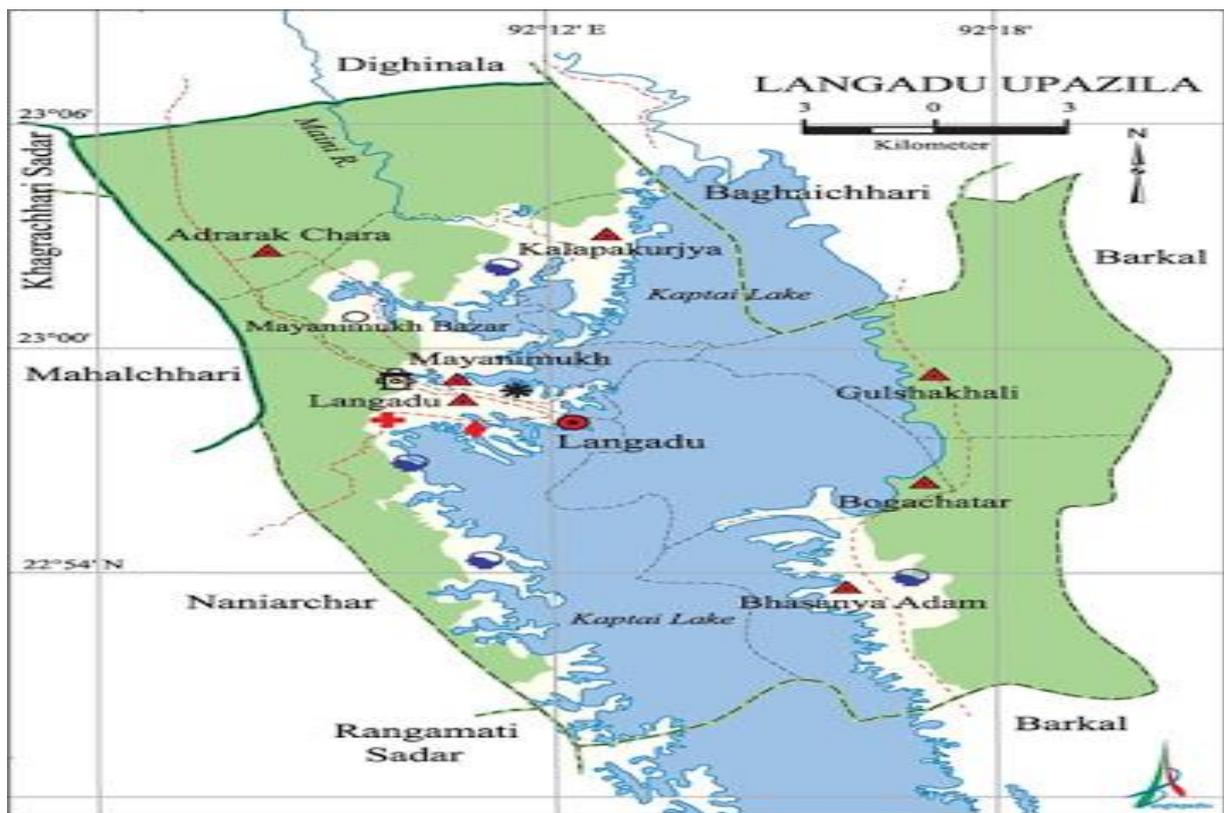


Figure 2: 3.2.1. Langodu upazila,,Rangamati

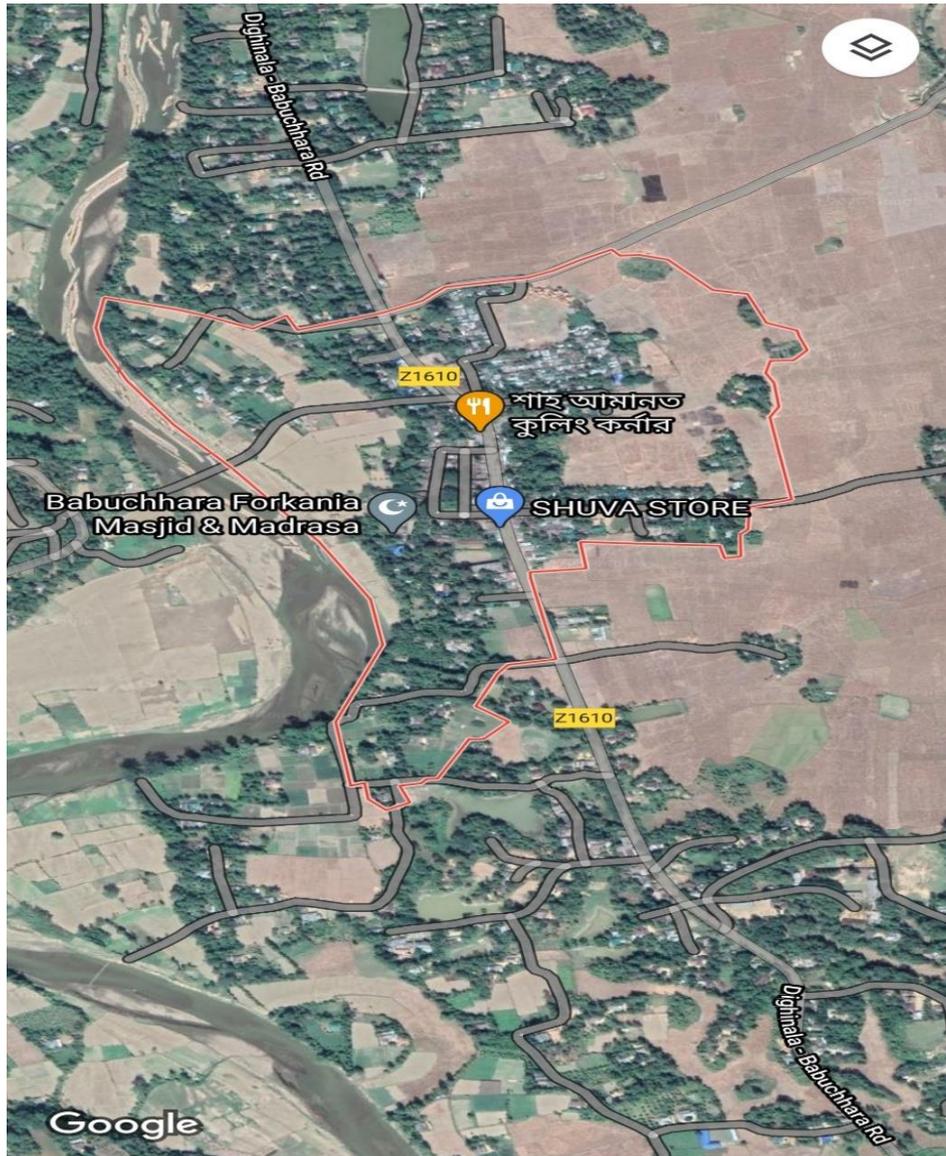


Figure 3: 3.2.2. Babuchara,Dighinala,, Khagrachari

3.3.Sampling

The methodology of this study focused on qualitative investigations and thus convenience sampling has been followed for the survey part of the study. This is a best way of attaining preliminary information regarding some research question quickly and reasonably. A total of 60 respondents are taken by using convenience sampling from Langadu Upazilla, Rangamati and Babuchara, Dighinala, Khagrachari.

3.4. Data Collection

After formulating objectives and having a clear idea about the study area, it is an important

task to prepare a data list that is required to meet the objectives. The outcome of a research depends fully on the data accumulated for this purpose. The data sources include both Primary and secondary data sources.

- Primary Data Collection
- Secondary Data Collection

3.4.1. Primary data collection:

After having the knowledge of relevant primary data, the data were collected through an extensive field survey in the study area. A survey questionnaire or survey data sheet was prepared for primary data collection which includes the relevant variables regarding the study objectives.

As I selected 2 areas, I visited these selected areas and survey 30 jhum owners from each area. This survey was 20 minute discussion type survey.

3.4.2. Secondary data: However, apart from primary data, the secondary data collection also very essential to conduct the study which were collected from like-relevant scientific articles, journals, thesis paper, relevant report, studies conducted by Government Organization and from the report..

- Different books,
- Reports,
- scientific articles,
- Documents,
- Official records,
- Journals,
- Thesis papers,
- Studies conducted by Government Organization and from the report,
- Different types of data like Google earth map were collected from internet.

3.4.3.Data Processing:

It was not so easy to analyze the raw data that collected from the field survey. It required further necessary editing and processing. So, the raw data were edited to remove possible errors and processed to a suitable form that made the data analysis easier.

3.4.4.Data analysis:

During the research work, the data and information from primary field survey and secondary sources were interpreted and analyzed with the help of computer software tools Microsoft Excel, SPSS, mapping (ArcGIS 10.2.1), Google Earth Pro, etc. in accordance with the objectives of the study. Also need a structured questionnaires, structured discussion form. Then findings were portrayed and arranged through various tables, charts, figures, graphs and maps. We used a digital voice recorder, a digital camera etc. Also, we had a well- organized workforce, who helped us to do a great work indeed.

3.5.Questionnaire Survey: A well designed questionnaire is the only way to meet the required data to fulfill the objectives. Questionnaire was developed, encompassing all the data in data understanding of all respondents. Questionnaire survey was conducted through pre-designed questionnaire focusing on user perception about the Jhum cultivation. To continue this survey was conducted one to one questionnaire interview with those people in these selected area who has own land(10 persons) and who doesn't have own land but work for others land(10 persons). Survey was conducted separately and 10 persons who are not related to Jhum cultivation from each area. The duration of this survey was done in 3 weeks.

3.6.Capturing of Photographs: Lot of photographs was also needed to illustrate the situation of the study area etc. Some of these photographs have been collected directly from the field.

3.7.Field observation: After questionnaire survey I was visited another different Jhum as I selected areas but except those where I have visited before. This observation helped me to find out different practicing system used in Jhum cultivation and will understand which

practice will be beneficial or which have bad impact on environment in CHT (Rangamati and Khagrachari).

CHAPTER 4: DEFINITION OF JHUM

(Shifting Cultivation)

Jhum cultivation:

Shifting Cultivation (Jhum) in CHT Jhum development is an exceptional sort of means cultivating on messy slopes of the indigenous bumpy individuals in CHT. This technique for development is otherwise called "Cut and Burn" or "Swidden" development. Around 60,000 families occupied with jhum cultivation in CHT (Khan and Alam, 2015). The significant strides of Jhum development including land choice, land readiness, planting constantly, weeding, bug the executives, collecting, sifting and putting away. Land arrangement ordinarily begins from March for jhum development. From the outset, the standing vegetation are cut and permitted to dry during the dry time frame. The dried vegetation and the fallen logs are scorched in the long stretch of April and May. The somewhat consumed or unburned logs are then hauled out of the Jhum land and accumulated. The land is prepared for crop foundation at the main shower, which for the most part happens in April or May. Planting initiates when the storms begins and the ground is immersed, by and large in the long periods of May and June. Seeds of various yields are planted combinedly in single slope according to the cultivator's arrangement. Gathering begins from July and proceeded to December.



Fig 4: View of a Jhum (Khagrachari)

Jhumians produce develop crops whatever they need including grains, vegetable, beat, oilseed, flavors, products of the soil. For the most part, level to direct inclining land is utilized for yearly yields 10, for example, upland rice, ginger, turmeric, stew, cassava, cucurbits, pigeon pea,

sorghum, maize; steep sloping land for developing distinctive yearly harvests however with the upkeep of vegetative covers, for example, form bio-hedgerows of leguminous plants and trees to ensure top soil; and steep land is utilized for developing jackfruit, guava and lemon while the north, east and north east slants were utilized for planting neighborhood assortments of banana and plantain (*Musa paradisiaca*). Already, 15-20 harvests used to be developed together, presently 5-8 yields were generally filled in a Jhum field (Chakma and Ando, 2008). Rice is the significant harvest segment of jhum field and normal yield 1.15 t ha⁻¹, however rice developed as fundamental harvest banana gives the greatest yield of 108 t ha⁻¹ (Jamaluddin et al., 2010). Yields of various harvests in jhum plots significantly fluctuated because of precipitation changeability, number of yields planted and the executives rehearses. Nonetheless, lately hardly any Jhum cultivators is more intrigued to create cash crops like ginger and turmeric as opposed to paddy.

CHAPTER 5: RESULT AND DISCUSSION

Chapter 5: Result and discussion:

5.1 Use of land :

In this field survey, 20 jhum cultivators were interviewed about the quantity of land only used for jhum cultivation in two upazilas of Rangamati and Khagrachari district. In Babuchara upazila the Jhum cultivators are using 41 acres of land for jhum cultivation. In Langadu upazilla 38 acres of land is being used for jhuming .Total 79 acres of land is being used by jhum cultivation of two upazilas in Rangamati and khagrachari district.

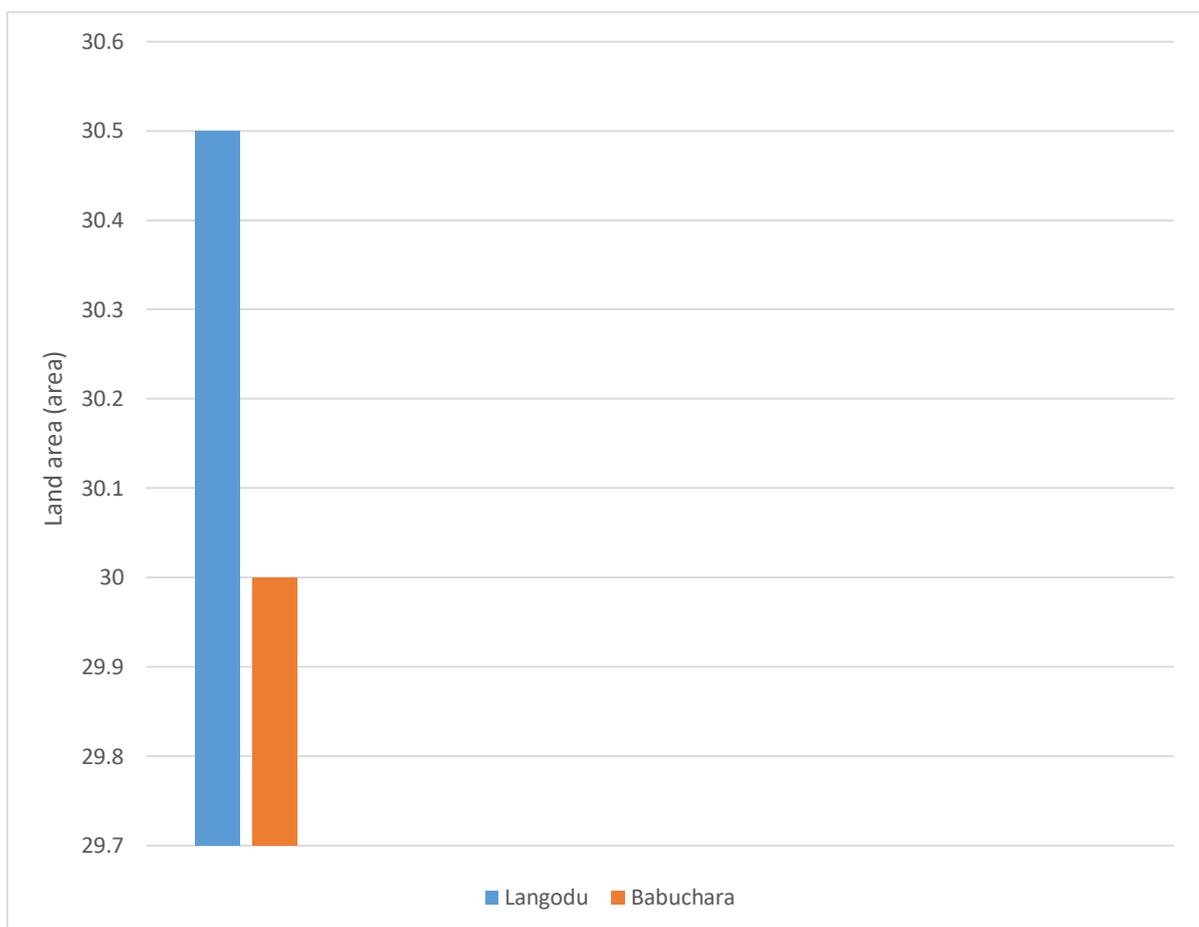


Table 1: Use of land to Jhum cultivation of the respondents

5.2. Jhum Practice cycle: Jhum cycle implies the neglected time of moving development. In this examination it was seen that in past period a large portion of the cultivators (67%) were polished Jhum cycle over 6 years. About 30% and 3% respondents were polished 4-6 years and

≤ 3 years Jhum cycle individually. Yet, in current circumstance > 6 years Jhum cycle practice is nil. A large portion of the respondents about 80.00% were said that they rehearsed neglected period ≤3 years for moving development and the remainder of the respondents said that they rehearsed 4-6 years of Jhum cycle.

Table 2: Duration of Jhum Cycle practices for cultivation.

Period	Range	Respondents
Past	<= 3 years	67% (6 years)
	4-6 years	30% (4 years)
	>6 years	3% (<=3 years)
Present	<= 3 years	80% (<=3 years)
	4-6 years	20% (4-6 years)
	>6 years	

5.3. Land selection: Land selection is finished during the period of February. Soil fruitfulness, level of slope slant, availability and distance from the towns are the primary thought for the determination of land for Jhum. Cultivator decides soil fruitfulness from the dirt tone and development of the brambles. Dark hued soil and terrains with lively development of vegetation are considered as rich land appropriate for Jhum development. Openness and closeness of the Jhum land from the property are likewise thought of while choosing land.

5.4. Land arrangement: Land readiness normally begins from March. To start with, the standing vegetation are cut and permitted to dry during the dry time frame. The dried vegetation and the fallen logs are scorched in the period of April and May. The somewhat consumed or unburned logs are then hauled out of the Jhum land and accumulated. A portion of these woods are utilized to make wall to get wild creatures far from the Jhum land. The land is prepared for crop foundation at the primary shower, which as a rule happens in April or May.



Figure 5: Land arrangement for Jhum

5.5. Planting a lot: Sowing begins when the rainstorm begins and the ground is soaked, for the most part in the long periods of May and June. A limited opening, around three inches down, is burrowed with the dull square finish of a tagol (blade); a small bunch of blended seeds of rice, vegetables and cotton and so forth are then positioned in the opening to finish the cycle. The amount of rice seed is more prominent than that of different kinds planted by this cycle, as rice is the staple food and cultivator mean to boost development of this yield. Creepers, including pumpkin, yam, sweet gourd, and watermelon, are brought up in hills some distance away.

5.6. Weeding: Jhum requires least weeding. Weeds are controlled physically by utilizing the tagol. A few times weeding are important. Every single cultivator thusly helps their neighbor

in weeding.

Nuisance administrations: Among the bug bugs rice bugs (*Leptocorisa acuta*) are accounted for to be significant irritation. However, vertebrate irritations, for example, rodent, wild pig, deer, monkeys and wilderness fowl additionally cause extensive harm. Hence, cultivators assembled little house privately called Tong ghor in the Jhum field for guarding the yield against these vertebrate irritations. The wild pigs and deer may truly harm the youthful rice plants. Then again rodents, monkeys and wilderness fowl cause genuine harm to maturing crop. Presently a day the most eminent change is the utilization of pesticide and substance manures by some rancher to improve creation.



Figure 6: Tong ghor

5.7. Yield gathering: Harvesting starts at the ready. The primary harvest to ready is maize in mid-July, trailed by melons and various assortments of vegetables. Rice and different grains are prepared for gather in September, and cotton, the last yield, is gathered in October. The rice panicles are gathered and brought to the impermanent house in the Jhum field. An extraordinary

sort of blade privately called chari is utilized for gathering rice panicles. Rice straws are cut from the base and leave in the Jhum field for not many days. Yield of Jhum crops are found to differ among years and between Jhums. It was seen that dissemination of precipitation was the main factor on which creation generally depends. The following significant factor is the weed the board.

5.8. Jhum rice sifting and putting away: Threshing of Jhum rice is generally done by foot. At times sticks are utilized. Rice is typically put away as unhusked paddy either in the gunny sack or putting away holder made of bamboo.

5.9. Jhum cycle: A normal Jhum cycle before formation of Kaptai Dam was 10 to 20 years or considerably more. Such longer cycle ordinarily didn't make genuine harm soil a lot fruitfulness. However, intense deficiencies of plain cultivable land as a result of immersion by Karnafuli Lake and populace pressure because of birth and migration from plain region abbreviated the neglected period. This has brought about declining soil ripeness, lower yields and speedy soil disintegration bringing about soil debasement. Likewise, cultivator accepted the open door to develop Jhum in one to two seasons while setting up plantation or planted backwoods.

5.10. Jhum crops: Jhum cultivator produce nearly all whatever they require. Huge quantities of grains, vegetable, beat, oilseed, flavors, products of the soil fiber crop were found to fill in the Jhum fields and rice was consistently the fundamental harvest. It was seen that around 30 yields, were filled in Jhum chash. Cultivators utilize numerous customary assortments for every one of the previously mentioned crops. In the previous 15 to 20 yields used to be developed together, which used to supply practically all the necessities of food and fiber. At present 5 to 8 harvests were normally filled in a Jhum field. Additionally, scarcely any Jhum cultivators were more intrigued to deliver money crops like ginger and turmeric as opposed to paddy, which was the basic component all through the CHT.

5.11. Jhum rice assortments: During field overview, around 22 sorts of Jhum rice assortments were found to fill in the Jhum fields. A portion of the customary assortments were glutinous however the vast majority of them were non-glutinous rice. For the most part glutinous rice were utilized for making cakes and sometimes for own utilization.

Table 3: Different type of crops grown in the Jhum field

Jhum crops names	Scientific name	No. of Jhum holders			Total
		Landless	Small	Medium	
Crops					
Maize	<i>Zea mays</i>	05	13	11	29
Vegetables					
Marfa	<i>Cucumis sp</i>	05	18	03	26
Cucumber	<i>Cucumis sativus</i>	03	23	02	28
Indian spinach (green)	<i>Baselia alba</i>	00	07	02	09
Barbati	<i>Vigna sp</i>	06	15	03	24
Okra	<i>Abeloschus esculennius</i>	00	03	01	04
Eggplant	<i>Solanum melongena</i>	06	14	07	27
Kumra	<i>Largernaria sp</i>	03	09	06	18
Snake gourd	<i>Trichosanihes anguina</i>	01	06	03	10
Bitter gourd	<i>Momordica charantia</i>	05	07	00	12
Rib gourd	<i>Luffa acutangula</i>	00	03	00	03
Hill gourd	<i>Lagenaria sicceraria</i>	07	06	00	13
Spices					
Chili	<i>Capsicum spp.</i>	07	17	3	27
Ginger	<i>Zinbiber officinalis</i>	02	21	5	28
Turmeric	<i>Curcuma longa</i>	03	14	06	23
Pulses					
Arhar	<i>Cajanus cajan</i>	01	04	00	05
Fruits					
Banana	<i>Cajanus cajan</i>	03	18	04	25

Water melon	Citrullus lanatus	03	04	17	24
Fibre					
Cotton	Gossypium sp	00	11	02	13



Figure 7: A child collecting turmeric from their own Jhum.(Khagrachari)



Figure 8: Farm of pineapple (Rangamati)

5.12. Effect of Jhum cultivation on climate :

This examination demonstrated that the climate of the considered territory was debased through jhum development. Among the respondents most extreme respondents (86.67%) had offered input that deforestation was the major ecological issue made by jhum development. About 73.34% respondents had offered input that moving development quickened avalanche and loss of top soil. In this investigation 63.3% respondent had offered input that lost of wild creatures was happening because of consume brambles and trees for Jhum development and furthermore land debasement was happened because of slice and consume rehearses. In Table 2, 53.34% respondents were reacted that deficiency of flying creature species was likewise happened due

to jhum development, 36.67% and 46.67% respondents assessment were diminished natural equilibrium and expanded worldwide temperature, separately. Just 70% respondents were reacted that jhum development were made lessening crop yield.

Table 4. Effect on environment for Jhum cultivation

Types of impact	Respondents		Ranking
	Number	Percentage	
Loss of forest area(Deforestation)	26	86.67	1
Decrease of bird species	16	53.34	5
Decrease of wild animals	19	63.3	4
Fall of environmental balance	11	36.67	7
Damage of top soil	22	73.34	2
Loss of crop yield	21	70	3
Raise of temperature	14	46.67	6



Figure 9: Sliding of top soil

5.13. Nature of soil erosion due to jhum (shifting) cultivation:

According to the personal interview of people of the study area it was found that among the interviewees 36.67% peoples replied that the nature of soil erosion is high due to shifting cultivation practices. Similarly 46.67% and 20% peoples informed that the nature of soil erosion is medium and low respectively.

Table 5. Nature of soil erosion for Jhum cultivation

Rate of erosion	Respondants		Ranking
	Number	Percentage	
Low	6	20	3
Medium	14	46.67	1
High	11	36.67	2

5.14. Contributing Factors of environmental degradation:

Population growth is considered by 93.33% of the respondents as a major factor causing severe degradation of environment in the study area. The effects of population on degradation of environment are considered moderate and insignificant by 5% and 01.66% of the respondents respectively. Besides population growth, deforestation and over use of natural resources are identified as causes of severe degradation by 85% 50% of the respondents respectively. Lack of knowledge / technologies and lack of proper planning are treated as severe cause of degradation by 60% and 56.67% of the respondents respectively. Jhum cultivation is viewed as a severe cause by 28.33% and a moderate cause by 53.33% and an insignificant cause of degradation of environment by 18.33% of the respondents under survey. Lack of alternative livelihood is identified by 48.33% as a severe cause, by 38.33% as a moderate cause and by 13.33% as insignificant causes of degradation of environment.

The effects of water pollution and forest fire are considered severe cause by 38.33% of the respondents. Use of fertilizers/pesticides cause severe degradation of environment by opined 30% of the respondents. In addition cutting of hill, collection of soil, extraction of stone, river erosion and land slide as responsible for degradation of environment.

Moving development as a dubious practices as indicated by the assessment of the respondents were reacted that 85.45% of the respondents had offered the input that deforestation was happening fundamentally for moving development. It was highest level against other dubious

practices. The second most elevated positioned loss of biodiversity (69.09%) was happening for moving development.

Table 6. Contributing factors for environmental degradation of environment as realized by the Jhum cultivators

Factors	% of the Respondents			
	Extent of Degradation			
	Severe	Moderate	Insignificant	Total
Population growth	56	3	1	60
Deforestation	51	7	2	60
Deficiency of technologies	36	17	7	60
Deficiency of proper planning	34	20	6	60
Over use of natural resources	30	17	13	60
Use of fertilizer	18	31	11	60
Water pollution	23	33	4	60
Forest fire	27	25	8	60
Jhum cultivation/ shortening of fallow period	17	32	11	60
Deficiency of alternative livelihood opportunities	29	23	8	60
Monoculture plantation	13	35	12	60



Figure 10: Cutting trees for Jhum



Figure11:Land slide(Rangamati)



Figure12: Land slide

5.15. Advantages and Disadvantages of Shifting Cultivation

Notwithstanding having a few advantage of Jhum development there are numerous disadvantage. Conventional and simple technique for development with low venture are the critical advantages of Jhum cultivation. Conversely soil disintegration, biodiversity misfortune, deforestation, exceptionally high reliance on nature, lower yield, negative reaction from government authority and so on are a few disservices of Jhum cultivating.

5.16. Impacts of Hill Agriculture on Environment

Shifting cultivation on slopping zone quickens land corruption, timberland corruption, and biodiversity decimation in hilly area through deforestation and consuming. As a result, the entire climate is upset. Among all, furrow development and tobacco development are representing an extraordinary danger to the farming, backwoods, and climate in uneven regions. Aimless tobacco development leaves a negative effect on soil richness and whenever tobacco is developed it is hard to develop different harvests on a similar land, it's an incredible danger for agro-biodiversity, as this cutoff points ranchers' opportunity of decision for crop creation (Akhter et al., 2014; Islam et al., 2010). At any rate 60000-70000 MT of fuelwood are being scorched in 2000 tobacco handling furnaces consistently, causing exhaustion of common woods, undermining climate and biodiversity in the slopes (Ullah and Shamsuddoha, 2014). Around 13-14 tons of fuelwood is expected to handle tobacco leaves become on one hectare of land. Indigenous cultivating strategies for developing diverse yearly yields in slope slant and inappropriate administration of soil improved soil disintegration and made negative effect on soil efficiency. Chakma and Nahar (2012) announced the effects of Jhum development on climate which are given below-

- Loss of forest area (Deforestation)
- Loss of top soil
- Increase landslide
- Loss of animal biodiversity
- Loss of plant biodiversity
- Decrease environmental balance
- Decrease soil productivity
- Decrease biomass and
- Increase temperature

- Source of forest fire
- Decrease soil carbon storage

Outcome:

Outcomes of this survey are given below

1. Find out what kinds of crop production system they adopt.
2. Find out the factors of environmental degradation.
3. Find out the impact of Jhum cultivation.

Limitations and risks:

There were some limitations in this survey. These are-

1. Transportation facility (Remote area).
2. Not easy to communicate with people (Most of are uneducated).
3. Risk of health during field work because lack of health service facilities.
4. Pandemic situation.

CONCLUSION

The capturing or destroying of moving development had been in progress since the beginning of the twentieth Century. After Independence, jhum control programs began vigorously. Nonetheless, it was before long understood that money crop development couldn't be embraced as an option in contrast to jhuming which individuals practice mostly to meet their basic food prerequisite. The agro-ecological frameworks of the CHT have prompted a move in accentuation lately from jhum control to jhum the executives, all the more explicitly, to the administration of fallows. The Government of Bangladesh spearheaded agro-ranger service mediations in jhum cultivating cycles. The climate in the Chittagong Hill Tracts (CHT) is feeling the squeeze. Segment and ecological conditions are evolving. Jhum development is getting impractical. This, joined with different factors, for example, woods over abuse, is the reason for expanded land debasement, for example, soil disintegration, supplement decay, and diminished biodiversity. Data on the status of the climate is needed for the detailing of elective techniques for economical administration. The weights on the climate and the causative factors and cycles should be examined. New strategies should be created, applied, and tried for reasonable administration of jhum development.

RECOMENDATION

According to this research and based on scope and limitations of the present study and observation made by the research work the following recommendation are made for further study

- The present study was conducted in Langadu, Rangamati and Babuchara, Dighinala, Khagrachari Hill Tracts. Such studies are required in whole Hill Tracts and all over the country.
- Training and awareness are needed about impacts of Jhum in environment.
- This study is conducted in the hilly area only (locally known as Jhum), but also in further study, cutting trees and deforestation in plain districts is also needing to be under valuation.
- The government needs to take more steps to setup a helpline system in Jhum chas. It will help them to if any Jhum owner will face any problem or any inquiry for the Jhum practice.

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Questionnaire survey on The Impacts of Jhum on Hilly Area Langadu (Rangamati District) and Dighinala (Khagrachari District)

Program : B.Sc. (Hons) in Environmental Science and Disaster Management

Department: Environmental Science and Disaster Management

Faculty: Faculty of Science and Information Technology

A. General information

1. Name:
2. Age:
3. Education: a. Illiterate b. Secondary c. Above secondary
4. Profession: a. Daily labour b. Land owner c. Service holder d. Business

B. Assessing the pattern of cultivation

5. Pattern of cultivation: a. cropping pattern in jhum cultivation- single/double
b. cropping pattern in Terrace-singl/double
c. yield per hector

C. Exploring the detail information about Jhum Cultivation

6. Land Size: a.0.2-0. Acre b. 0.31-4 acre c.0.41-5 acre d.0.51-6 acre
7. Annual income: a.Low(20,000-35,000) b.Moderately high (30,000-50,000)
c.High(40,000-60,000)
8. Duration;

Period	Range/Year
Past	3/4/6
Present	3/4/5/6

9. Reasons for adopting jhum: a. an inherited practice
b. For livelihood
c. other cultivation method is unknown
d. Lack of plain land
e. Labour scarcity

10. Impact on environment:

Impact	Respondents
Deforestation	
Loss of top soil	
Loss of wild animals	
Loss of bird species	
Decrease environmental balance	
Increase temperature	
Decrease crop yield	

11. Contribution factors for degradation of environment

Factors	Respondents
Population growth	
Deforestation	
Jhum cultivation period	
Over use of natural resources	
Use of fertilizer/pesticides	

Lack of alternative livelihood opportunities	
Lack of knowledge about technologies	
Lack of proper planning	
Forest fire	
Water pollution	
Monoculture plantation	

12. Problems faced by the respondents of jhum cultivation

Problems	Respondents
Problem of capital	
Good seeding problem	
Land ownership problem	
Support	

13. Have you got any technical support: a. Yes b. No

14. Use of fertilizer

15. Do you think when fire to jhum its affect in a microclimate in local area?

16. Do you think we need any specific law on policy or branch of Government authority where all kind of information about jhum cultivation should be included?

17. Do you have any objection about the Jhum cultivation?