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Contents

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Teaching Sustainability through Content and Language Integrated Learning in English Language Classroom: A Survey on Primary Level Students in Bangladesh

Fahmida Haque*

Abstract

The paper aims to emphasize greening the classroom by integrating environmental and sustainability issues into English as a Foreign Language (EFL) lessons, which fundamentally means to be environmentally-aware and eco-conscious. Teaching EFL can provide the seamless opportunities to incorporate the growing consciousness of the green movement. Thus, teaching sustainability refers to teach students about the environment, climate change and conservation, and make them active players in the sustainability movement. However, while teaching English the pedagogy needs to focus not only on teaching the language but also the content. This can be executed through the Content and Language Integrated Learning (CLIL) lessons. The present paper aims to analyze the extent of teaching sustainability in EFL classrooms at the primary level in Bangladesh and find out how effective the CLIL lessons for EFL competency based on sustainability issues. The study is a mixed method research which is descriptive in type. Content analysis, survey, interview and classroom observation have been performed to collect the data. Samples (141 students and 5 teachers) have been taken from 4 primary schools (urban, semi-urban and rural areas) in Bangladesh to find the real scenario of teaching sustainability and students' awareness of sustainability along with their language learning. Findings of the study show students enjoy CLIL lessons based on sustainability issues. Moreover, they are being exposed to the language and learn the language related to the lesson. It's also a nice change for the TEFL teachers to be able to teach content rather than language. However, the study shows that though CLIL lessons based on sustainability issues is enjoyable to the students and convenient for the teachers, it has several challenges faced by two main stakeholders - students and teachers. The challenges are appropriate content, shortage of trained teachers, classical (GTM and DM) pedagogical method, non-interactive classes etc. Based on the data and insights found from the study,

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the research recommends for extensive training of EFL teachers about the effective application of CLIL; the class duration should be increased; flexibility in the syllabus according to students' need and interest; effective study materials etc.

Keywords: Sustainable Development, Content and Language Integrated Learning, Foreign Language Teaching, Primary Education

Introduction

Teaching sustainability is amalgamating environmental and sustainable issues in the classroom. Further it means preparing the students for future by developing creative, critical and problem-solving skills in them. In order to gain sustainability, education or knowledge about it is needed first. English being the Lingua Franca is compulsorily taught in all levels of education in Bangladesh. Learning English Language would be intriguing to students if the focus is shifted from language learning to contents. Incorporating sustainable contents in the English language classroom thus would be a win-win situation for both language learning and sustainable teaching. As our government is committed to teach students sustainability for reaching sustainable goals, it is to be seen how many contents of English textbook are sustainable and teaching sustainability is ensured in the primary level or not as the early exposure will lead to better learning.

Background of the Study

For the urgency of the deadening situation, United Nations declared 17 Sustainable Development Goals (SDGs) to be achieved by 2030. As a member of the United Nations and signatories of SDGs, Bangladesh is obligated to achieve these goals.The fourth of the seventeen goals centres on education with the mandate to ensure inclusive and quality education and promote lifelong learning opportunities for all (United Nations [UN], 2015). Bangladesh has made primary education compulsory with the view to provide education to all. Education plays a vital role in shaping attitude and behavior of the people. Thus, teaching sustainability can repeal the humanity from drowning in the sea of destructive climate change and inhabitable environment and bring changes in people to save the world for us and the future generations. Teachings of early age or teachings before the puberty period sustains longer for Critical Period Hypothesis (CPH). Thus, teaching sustainability, though a bit advanced concept, if can be taught in primary level, will be better for all. Teaching sustainability or teaching about sustainable contents can be done by different ways, as to mention, as a separate subject or by integrating sustainable contents in multiple disciplines. As Bangladesh is committed to SDGs, as a means of application, sustainable contents are incorporated in different subjects' textbooks.

The reason for attempting to ensure teaching sustainability in English language classrooms is that English is a name of trauma to most of the

students. If enough sustainable contents can be found in the English textbooks, and they can be taught through Content and Language Integrative Learning (CLIL) where the focus will be shifted to the content instead of language learning, then language learning will occur in a better way. Additionally, contents will be learnt which will increase awareness among the students to bring transformative changes in the society.

Statement of the Problem

Teaching EFL can provide unified opportunities to integrate the growing consciousness of the green movement. Hence Teaching sustainability means teaching students the subjects related to environment, climate change and conservation, and make them aware about their role in the sustainability movement. However, while teaching English the pedagogy needs to focus not only on teaching the language but also the content. This can be executed through the Content and Language Integrated Learning (CLIL) lessons. The present research aims to analyze the extent of teaching sustainability in EFL classrooms at the primary level in Bangladesh and find out how effective the CLIL lessons for EFL competency based on sustainability issues.

Research Objectives

General Objective

The present research has conducted with the following general objective:

- To analyze the extent of teaching sustainability in the EFL classrooms at the primary level in Bangladesh and find out whether the CLIL can be applied for EFL competency based on sustainability issues.

The study has attempted to accomplish goals, by achieving the following specific objectives:

- To evaluate the contents of the *English for Today,* Book-V, if they align with EfS or not.
- To find the pedagogy of teaching sustainability in the English as a foreign language classroom at the primary level in Bangladesh.
- To explore whether Content and Language Integrated Learning (CLIL) can be applied in teaching sustainability in the EFL classroom.

This study has taken forward by setting the following research questions:

- How much the contents of *English for Today* align with Education for Sustainable Development (ESD)?
- How is English as foreign language being taught at the primary level in Bangladesh?
- How can CLIL be applied in teaching sustainability in the EFL classroom?

Though the term sustainable development has its root in the 17th and 18th century, it became a prime concern in the late 20th century. The concept got a concrete base after the United Nations' set SDGs as people started realizing that everything is fleeting, and the future is becoming challenging to survive. For the signatory nations of the United Nations' SDG, sustainability is a buzzword. Education for sustainable development has been introduced as education can play a vital role in achieving sustainable development. Integration of sustainability issues can stimulate awareness of people greatly. Hence, teaching sustainability is a good move in this process.

Svanström et al. (2008), found that the commonalities of learning outcomes (LOs) includes sustainability directly or indirectly which improve quality of higher education. The researchers also mentioned the ways to achieve these LOs, in short.

Bowden (2010) called for consciousness regarding sustainability in order to change the widely held practices which are leading to the commodification of food, labour and the environment. In order to formulate a new perception, Bowden (2010) felt the need for a holistic understanding of sustainability by exploring the ideas connected to it. Thus, he explored the connections between learning and sustainability and the emerging discourse of Education for Sustainability (EfS), all of which challenge traditional teaching of following behavioural norms of society, for adapting to sustainable systems. EfS and English language teaching (ELT) can be associated easily as the former demands learning from all sectors of society, whereas the latter also often surpasses the boundaries of language instruction. He suggested various ways of strengthening the impact of ELT on sustainability, like- encouraging teachers to explore sustainable issues, selecting and developing context- related contents, reformulating ecology reflecting curriculum, emphasising more on EfS competencies, etc. Hence, by opening the vision, image and design of sustainable education, he suggested the empowerment of both ELT teachers and learners to be agents for change.

Students' perception towards sustainable development concepts is studied by Khalil, Ramzy and Mostafa (2013). The study has found that sustainable contents are necessary for their lives and future.

Fauzia's (2016) study was based on the adaptation of the Hutchinson and Waters (1987) procedure, was mainly carried out to outline the sustainability studies program by maintaining good quality in the English area, which, in turn, will be reflected as good skills among the language learners. Unlike teaching sustainability in the English language classroom, Fauzia in her paper provided an insight into the necessity of an English area for sustainability of education.

In their research, Asta and Margarita (2018) explored the role of foreign language teaching in promoting the sustainable development competence

(SDC) in higher education. The research showed a strong correlation between English proficiency level and the knowledge about sustainable development. It also showed stronger correlations between EFL learning and SDC, especially communicative, transformative and cross-cultural sub-competence.

In order to respond to the call of environmental issues, Jodoin and Singer (2019) attempted a framework for integrating Education for Sustainable Development (ESD) in the English as a Foreign Language (EFL) classrooms. The researchers emphasized the importance of SDG in this age of global change and stressed to incorporate those for the demand of the time in order to face future challenges that we are going to have in no time. The research showed that sustainable topics are tough for the children to comprehend, thus the implementation will work best from at least secondary level.

Kwee (2021) found various reasons that uplift self-efficacy and give motivation for combining SDGs into English teaching. The study, believing in the positive changes that teachers can bring, explored the reasons behind teachers' motivation for teaching sustainability.

Xiao and Pan (2022) explored the intrinsic and extrinsic enablers of sustainable development knowledge in the daily routine of students who are second or foreign language learners of English.

Moghadham, Narafshan and Anjmshoa (2022) studied the impact of sustainable education on reading comprehension and the empathy of English language learners.The study found that the children exposed to sustainable education outperformed the other children and they were also found to have better empathy.

Research Gap

Despite being a comparatively newer topic, a lot of studies have been done from different perspectives relating to different factors of sustainability development because of the high demand of time. While some researchers (Bowden, 2010; Khalil, Ramzy&Mostafa, 2013), showed their concern about sustainability of teaching, intrinsic and extrinsic factors (Xiao&Pan, 2022) working for learning sustainability, challenges faced by non-native English learners in learning sustainability (Asta&Margarita, 2018; Jodoin &Singer, 2019; the impact of learning outcomes of sustainable development in higher education (Svanström et al., 2008), etc. others also showed their concern about relation of EfS and ELT, teaching sustainability in higher education, motivation working behind teaching sustainability, teaching sustainability in special academic courses, teaching sustainability in English language classrooms to engineering students, etc. But previous researchers had yet shed their light upon teaching sustainability in English language classrooms to primary level students. This study is special for its

Bangladeshi context and the level of education chosen as the earlier exposure can be provided to students, the better and easier it will be for students to acquire sustainable knowledge along with the development of English language skills.

Research Methodology

This research has used mixed method combining both qualitative and quantitative approaches. In this study, numerical data of survey questionnaire have contributed to the quantitative part whereas, non-numerical data from open-ended interview, observation checklist and content analysis have contributed to the qualitative part of the research.

In this research, the researcher took stratified purposive sampling made by social and geographical position: urban, semi-urban and rural. Two urban schools from Dhaka and Mymensingh, one semi-urban school of Mymensingh and one rural school of Sirajganj has been taken.27 students and 1 teacher from a school of urban area (Dhaka), 41 students and 1 teacher from an urban school (outside Dhaka), 35 students and 1 teacher from semi-urban school and 38 students and 2 teachers of rural area are the participants. Hence, the sample size is 141 students and 5 teachers.

Data Analysis and Discussion

Content Analysis of Textbook

ESD as the director or guide suggests topics related to all SDGs like: climate change, disaster risk reduction, biodiversity, ecosystem, poverty reduction, sustainable consumption, staying fit, equity, games and sports, practical skills, reflective and critical competencies, etc. But, ESD has been modified accordingly for this study and the topics related to environment, in some way or other, is the concern of ESD in this research. Hence, natural disasters, disaster risk reduction, biodiversity, environmental beauty, environment pollution, sustainable consumption, etc. topics of ESD are at the basis of this study. In the textbook of *English of Today*, Class-V, there are presence of these themes in various lessons. “Eat Healthy” discusses about food pyramid and healthiness. “Be Healthy” also talks about healthy food, needed for staying fit. Both of these lessons are related to sustainable consumption. “How Far is Saint Martin’s?” highlights some tourist places of our country and shows the biodiversity, like turtles, sea fishes and other sea creatures. It also draws attention to the clean and blue water, which is beautiful when unpolluted. “City and Country” lesson consists of a poem showing a contrasting picture of city and village, where village is close to nature and city is more polluted. “I Meant to Do My Work” is a poem stressing to focus on the ignored beautiful creatures of nature and beautiful natural environment. “It Was a Great Day!” is a lesson about cub camporee. But it picturizes Sreemangal, a tourist place of Bangladesh, having tea gardens, forests with different animals, small hills, etc. “Stay safe!” mainly

discusses about the precautionary measures of earthquake but it also draws attention to other natural disasters. "Cyclone Aila" as the name suggests talks about a cyclone, the damage it did to people's life and environment and the post-disaster management of it. "Story: The Hare and The Tortoise" and "Story: Why Does the Frog Croak" are moral and fictional animals. But they have the pictures and picturization of forests and animals which can drive students' attention to the environment and conservation of biodiversity and eco-system. The mentioned lessons align with ESD, some of which are incorporated in the survey and interview to bring out the facts and meet the objectives. As these lessons align with ESD, these contents can be used to apply CLIL for teaching sustainability and bring transformative changes along with the language development.

Analysis and Discussion of Students' Questionnaire

The data collected from the survey questionnaire is discussed in this part of the chapter. 25 MCQs were with proper adaptation for primary level students, and most of the 4-point Likert scale options are coded as "A= Not at all", "B= Little", "C= Fairly" and "D= Very Much" in the text and graphical analysis where A and B will be considered as "negative responses" and C and D as "positive responses". The analysis of data and the obtained result from them are discussed below:

Lessons Taught in the Textbook

This question was asked to know how much ESD related lessons are taught in the classrooms. 16 different topics related to lessons of textbook were given to know which of those are taught in the classroom.

SL.	**Lessons taught in the textbook**	**Number of Students(in Percentage)**	**Number of Teachers (in Percentage)**
1.	Speaking with Others in English	82%	100%
2.	Healthy Food	87%	100%
3.	How to Stay Healthy	85%	100%
4.	Your Home District	83%	100%
5.	Tourist Spots of Bangladesh	76%	100%
6.	Writing Letter in English	87%	100%
7.	Learning Clock Time	83%	80%
8.	Tale of Hare and Tortoise	92%	100%
9.	Learning Handicrafts (Bird Made of Ribbon)	76%	80%
10.	Different Games and Sports	87%	100%
11.	Martyr Monument (Shaheed Minar)	74%	100%

12.	Village and City	73%	80%
13.	Liberation War of Bangladesh	87%	80%
14.	Cub Camporee	91%	100%
15.	How to Stay Safe	84%	100%
16.	Cyclone Aila	95%	100%

Table 1: Lessons taught from the textbook

More than 90% students are aware of the fact that, lessons related to "Tale of Hare and Tortoise", "Cub Camporee" and "Cyclone Aila" are there in their textbook. More than 80% students know about the presence of lessons about "Speaking with others in English", "Healthy Food", "How to Stay Healthy", "Your Home District", "Writing Letter in English", "Learning Clock Time", "Different Games and Sports", "Liberation War of Bangladesh", and "How to Stay Safe". This shows that, the mentioned lessons are taught in most schools or classes and more emphasized for which students know about them more. 70%-80% students know about the lessons of "Tourists Spots of Bangladesh", "Learning Handicrafts (Bird Made of Ribbon)", "Martyr Monument (Shaheed Minar)" and "Village and City". Considering the broader perspective, it is a positive picture indicating that all the lessons of the textbook are taught in the classroom more or less. This phenomenon is supported by the teachers' view as almost all teachers (80%-100%) confirmed that they teach the above-mentioned lessons.

Lessons Preferred by the Students in the Class

The former question asked about the lessons taught in the textbook. After investigating the lessons taught and students awareness about that, this questioned inquired about the lessons liked by them.

SL.	**Lessons Preferred in the Class**	**Number of Students(in Percentage)**
1.	Speaking with Others in English	65%
2.	Healthy Food	65%
3.	How to Stay Healthy	68%
4.	Your Home District	69%
5.	Tourist Spots of Bangladesh	45%
6.	Writing Letter in English	70%
7.	Learning Clock Time	60%
8.	Tale of Hare and Tortoise	79%
9.	Learning Handicrafts (Bird Made of Ribbon)	61%
10.	Different Games and Sports	74%
11.	Martyr Monument (Shaheed Minar)	38%

12.	Village and City	59%
13.	Liberation War of Bangladesh	62%
14.	Cub Camporee	77%
15.	How to Stay Safe	63%
16.	Cyclone Aila	73%

Table 2: Lessons preferred by the students

Maximum students (77%-79%) liked the lessons "Tale of Hare and Tortoise" and "Cub Camporee". This proves that elementary students always like stories and interesting lessons rising their inquisitiveness. The next preferred (74%) lesson is "Different Games and Sports" as children like in practical life. Lessons that contain practical implementation or lessons that are about the incidents of our life are also preferred by them for which "Writing Letter in English" and "Cyclone Aila" is preferred by 70% and 73% students respectively. Other sustainable topics such as "Healthy Foods", "How to Stay Healthy" and "How to Stay Safe" are liked by more than 65% students. The reason behind liking "Cyclone Aila" more than "How to Stay Safe" might be because students could relate the former more with their life as few days before the data collection "Cyclone Sitrang" happened whereas the later lesson is quite theoretically presented. Similarly, "Village and City" topic is given in poetry form which might be difficult to some as a result of which it is liked by 59% students. "Tourist Spots of Bangladesh" though interesting is tough for many students for which it is preferred by 45% students, reflecting the importance of vocabulary improvement. However, in general, different stories and lessons related to sustainable topics are liked by students as we can see from the above table, which makes the path of implementing CLIL open for teaching sustainability.

Students' Knowledge About Healthy and Unhealthy Food

Most of the students (93%) informed that they have the awareness about healthy foods. But still 7% of them do not have proper consciousness about it. Sustainable consumption and eating healthy foods include in teaching sustainability, hence, it was asked to understand students' awareness about a basic sustainable topic provided in their book which aligns with ESD.

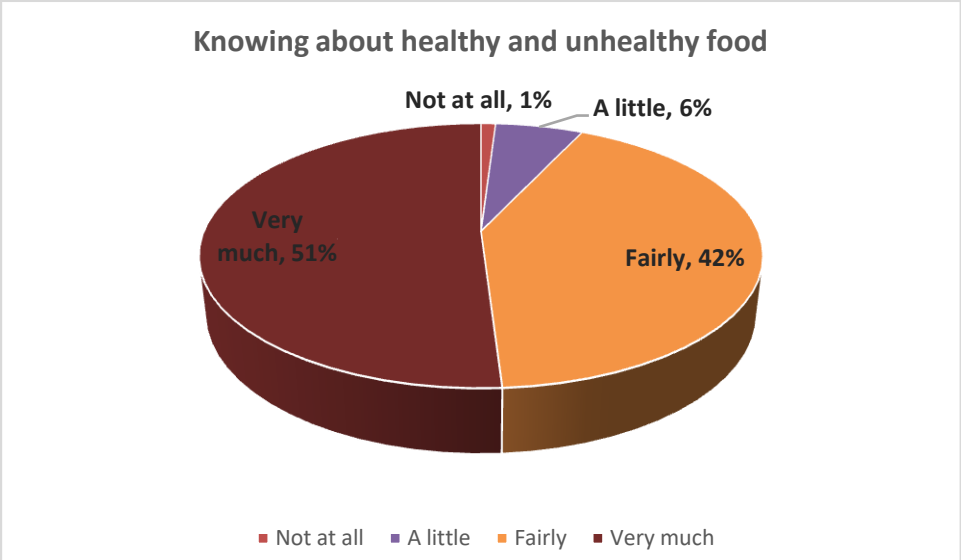

Figure1: Knowing about healthy and unhealthy food

Students' Knowledge about the Precautionary Steps Taken During Natural Disaster

A question was asked to know whether participants can say in English what precautionary steps to be taken during natural disaster. This was posed to find the speaking skill

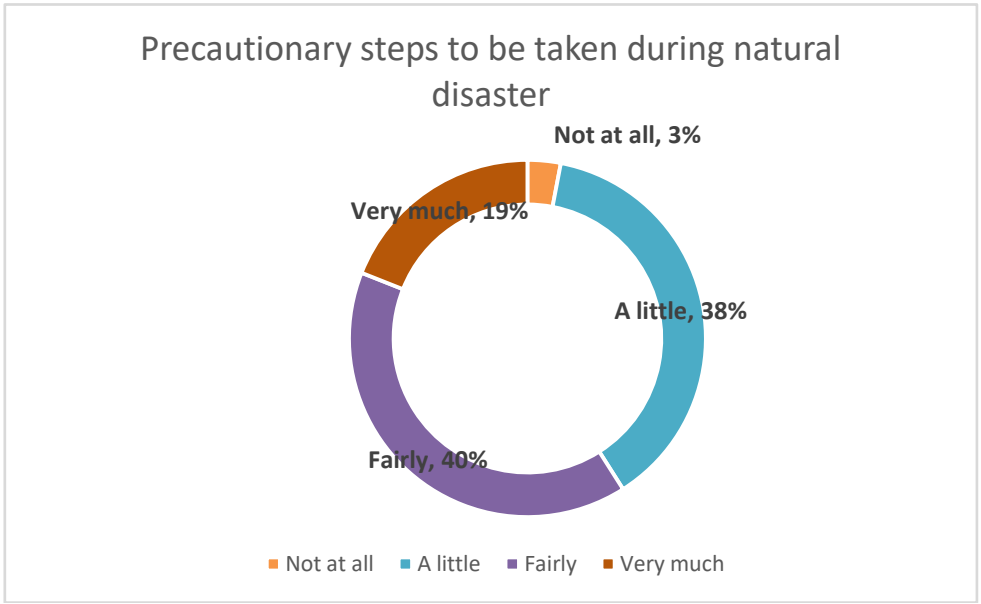

Figure 2: Precautionary steps to be taken during natural disaster

of students indicating the effectiveness of current pedagogy and specially to find sustainable awareness among students. Majority students (59%) claimed that they can say about the precautionary steps of natural disaster. While almost half41% of them responded negatively and are not confident about their English-speaking skill in sustainable topics. Though 73% students preferred the natural disaster related topic, but almost half of the students are not aware of the precautionary steps of natural disasters and thus they think they cannot speak well in disaster related subjects.

Naming Tourist Places of Bangladesh

Knowing about the tourist places of a country includes knowing about the biodiversity and environmental beauties of that country, making it a part of ESD. Thus, this question was also placed with the objective of knowing students' awareness of sustainable topics at a very basic level.

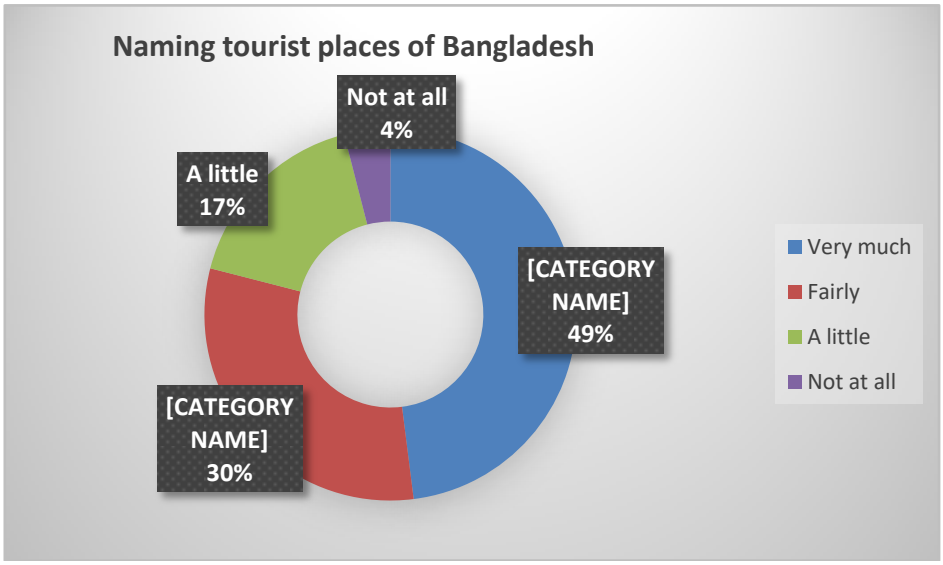

Figure 3: Naming tourist places of Bangladesh

In reply to the indirect question of whether they can name the tourist places of Bangladesh, 79%gave positive response while 21%gave negative response.

Writing about Environment Pollution in English

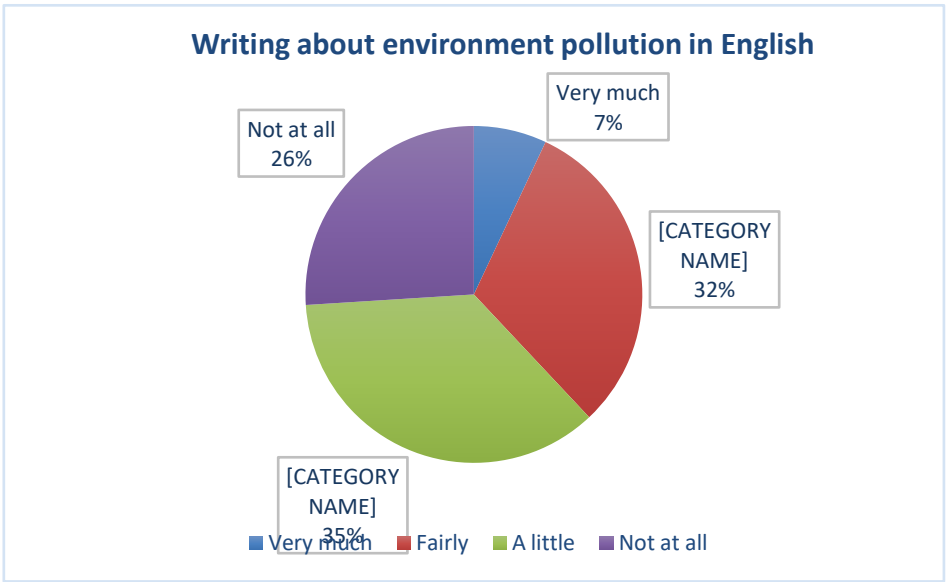

Figure 4: Writing about environment pollution in English

Environmental pollution is one of the most vital topics of ESD and everyone should have the awareness of environment pollution so that they can maintain ecological balance and can ensure environmental justice by

minimizing pollution. Whether students can write about environment pollution in English was asked to find writing skill and environmental awareness among students.

Here, it is found that the positive responses is only 39% and most (61%) of the student scannot or barely write about environmental pollution. This supports the answer to the previous question where the students were asked whether they can say the precautionary steps of natural disasters in English. But while asking the preference of lesson as "How to Stay Safe", 65% students gave positive response.

Talking about Cub Camporee in English

Cub Camporee chapter in one hand teaches about hard work, physical fitness, leadership and problem-solving abilities of an individual, on the other hand, discusses about a tourist place of Bangladesh showing biodiversity and environmental beauties, raising awareness. It is an adaptation of the topics directed in the ESD. Thus, whether participants can say about Cub Camporee in English was asked to find their speaking skill along with sustainable knowledge.

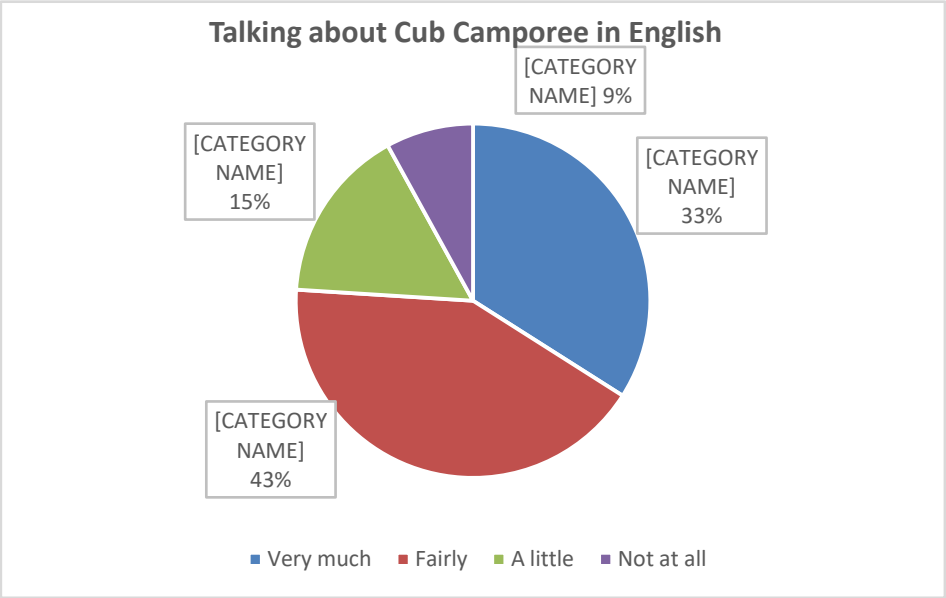

Figure 5: Talking about Cub Camporee in English

Most (76%) of the students claimed that they can say about Cub Camporee. On the other hand, 15% opined for "A little" and9% informed they cannot tell at all. It makes the negative response 24% which should be taken care of by teaching these topics more effectively.

Analysis and Discussion of Teachers' Questionnaire

Most data given by teachers were similar to that of students' but he data that varied noticeably from the students' one is discussed below, showing a comparative picture:

Appeal of the Class Lessons

If the lessons of the textbook are aligned with ESD and the lessons are appealing or attractive to the students, then CLIL can be applied for teaching sustainability. Thus, a question was asked to know whether the class lessons are appealing or not.

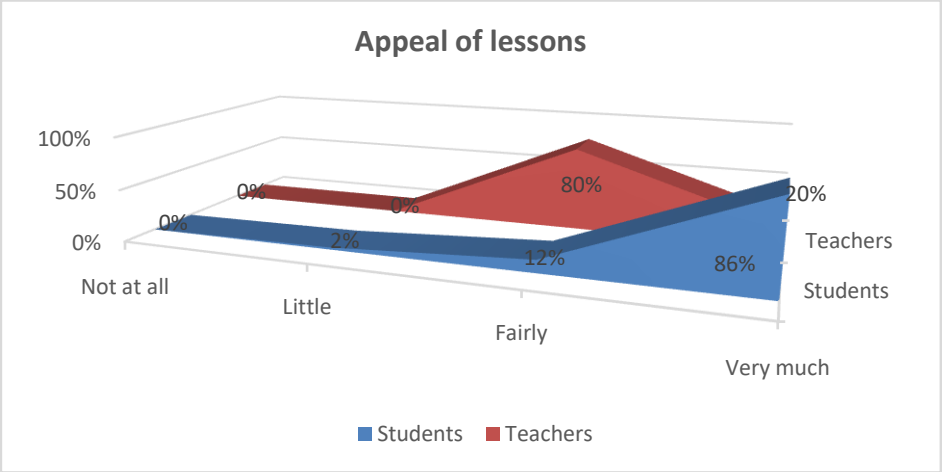

Figure 6: Appeal of the class lessons

In response to the query, interestingly 86% students informed that the class lessons are "very much" appealing whereas 80% teachers consider the class lessons are moderately appealing to them. Similarly, when only 12% students found the class lessons as "fairly" appealing, 20% teachers consider them "very much". However, 2% students replied in the negative which is actually negligible.

Preferred Way of Learning

The survey results of how students like to learn is not a predictable one. In this age, when group works and interactive learning is much emphasized, 43% students viewed that they like to learn alone. 28% students like to learn in pair and 17% students like to learn in large groups. The least (12%) number of students preferred small group.

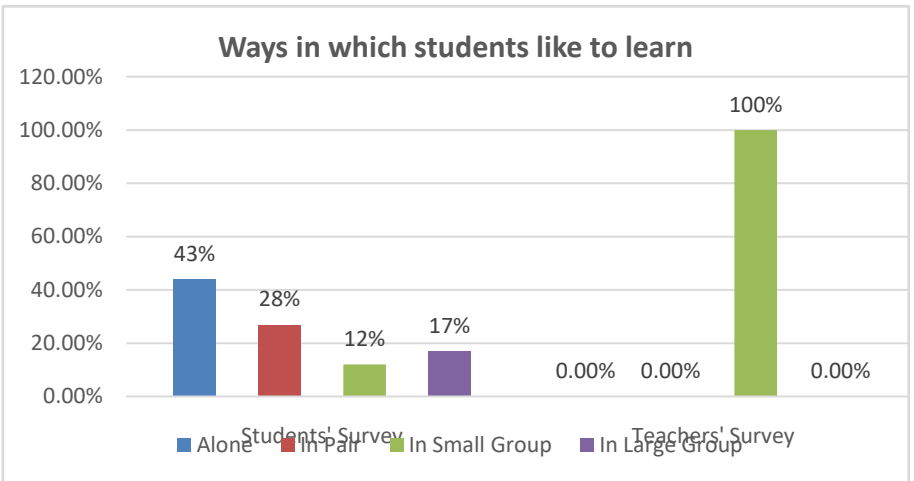

Figure 7: How the students like to learn

In the curriculum, when group works and interactive learning is much emphasized, teachers thought students prefer learning in small groups. Monitoring large group activities is also a tough one. All the teachers participating in the survey thought students prefer learning in small groups whereas the least number of students (12%) preferred small group. Moreover, maximum students (43%) viewed that they like to learn alone.

Relevancy of Class Lessons with Everyday Activities

According to ESD, most of the lessons of the textbook should be relevant with everyday life. In order to understand the current pedagogy and how much textbook is followed in the class, a question was posed for the relevance of class lessons with everyday activities. The lessons of the class should also be relevant with everyday activities because most of the lessons of the textbook are designed in that way.

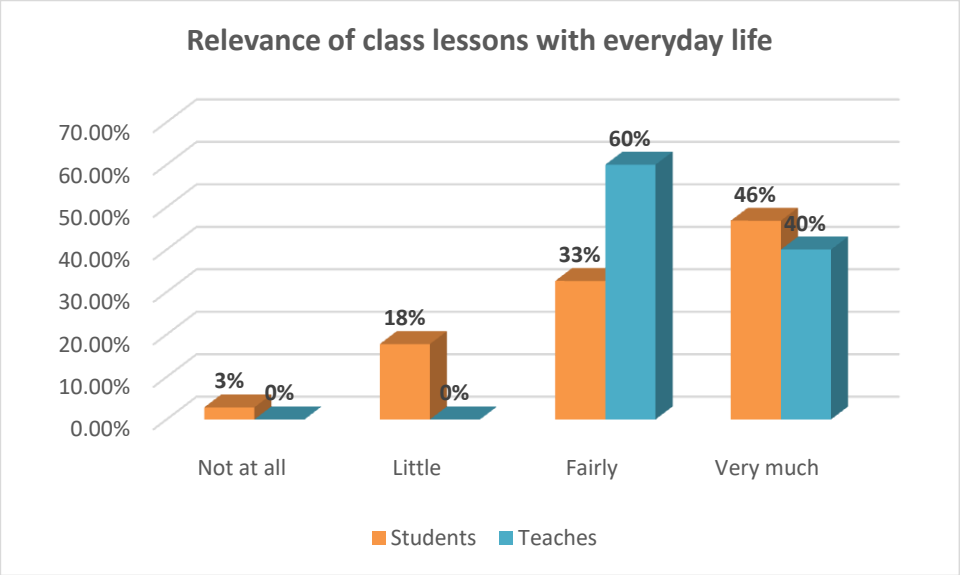

Figure 8: Relevance of class lessons with everyday life

While 100% teachers gave positive responses 79% students found the class lessons relevant with everyday life. The rest 21% students' view cannot be ignored. This demonstrates that either the present textbook is not followed properly, or the current pedagogy teaches lessons theoretically without relating with reality to a mentionable extent.

Comparison of Lessons Preferred by the Students and Teachers

Lessons Preferred in the Class	**Number of Students (in Percentage)**	**Number of Teachers (in Percentage)**
Speaking with Others in English	65%	80%
Healthy Food	65%	80%
How to Stay Healthy	68%	**100%**
Your Home District	69%	**100%**
Tourist Spots of Bangladesh	45%	60%

Writing Letter in English	70%	80%
Learning Clock Time	60%	40%
Tale of Hare and Tortoise	79%	100%
Learning Handicrafts (Bird Made of Ribbon)	61%	40%
Different Games and Sports	74%	100%
Martyr Monument (Shaheed Minar)	38%	**80%**
Village and City	59%	80%
Liberation War of Bangladesh	62%	80%
Cub Camporee	77%	80%
How to Stay Safe	63%	**80%**
Cyclone Aila	73%	**80%**

Table 3: Comparison of lessons preferred by the students and teachers

It has been found that there is a difference of opinion between the students and teachers view regarding the preferred lessons. For example, it was observed that while the lesson "Your Home District" was preferred by 100% teachers, only 69% of their students like it; again, most important sustainable lessons like "How to Stay Healthy" or "How to Stay Safe" were preferred by only 68% and 63% students respectively. Similarly, students were less interested to know of the historical/nationally important places, e.g. "Shaheed Minar" (38%). In short, the teachers think sustainable topics are preferred by their students. However, it has been found that the students less prefer the sustainable topics because they consider those as difficult or uninteresting.

Teachers' View on Students' Ability to Name Tourist Places of Bangladesh

If students could name many tourist places of Bangladesh which are in the textbooks, this would have indicated they learnt those lessons well and some consciousness about the environment and biodiversity presented in those lessons are also grown in them. Hence, teachers were asked if their students can name the tourist places of Bangladesh.

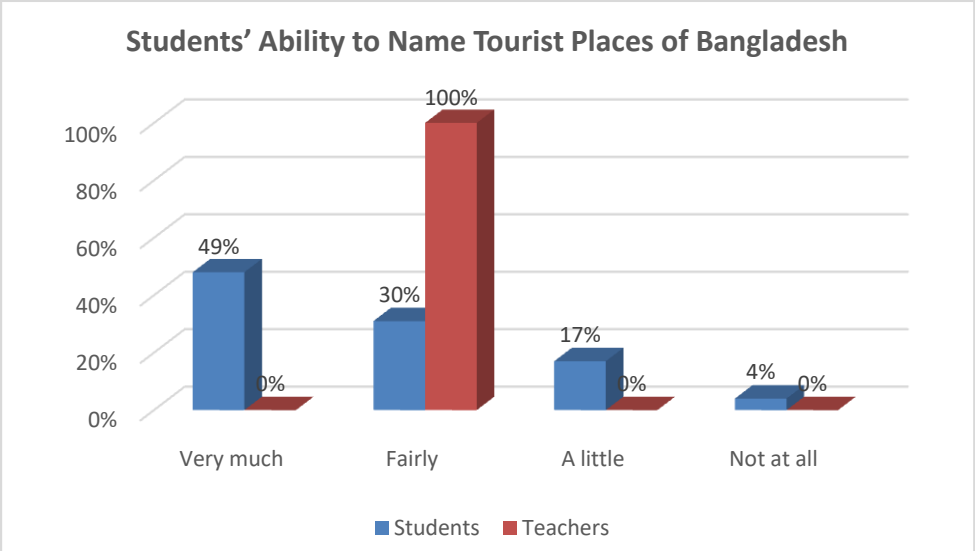

Figure 9: Students' ability to name tourist places of Bangladesh

100% teachers claimed that their students have moderate knowledge about the tourist places of Bangladesh while 21% students themselves thought it negatively. Students' lack of knowledge about the natural diversity of our country or lack of comprehensive ability is more than teachers think.

Students' Ability to Write about Environment Pollution in English

Teachers were asked whether their students can write about environment pollution in English. 80% teachers opined positively ("fairly") in response to the question and 20% opined negatively which was "A little". However, only 39% students themselves said they can write about environment pollution in English. 61% students responded negatively about their ability. This reflects the problem in the current pedagogy of primary level because students like reading these topics (informed in previous questions) but their outcome is not satisfactory.

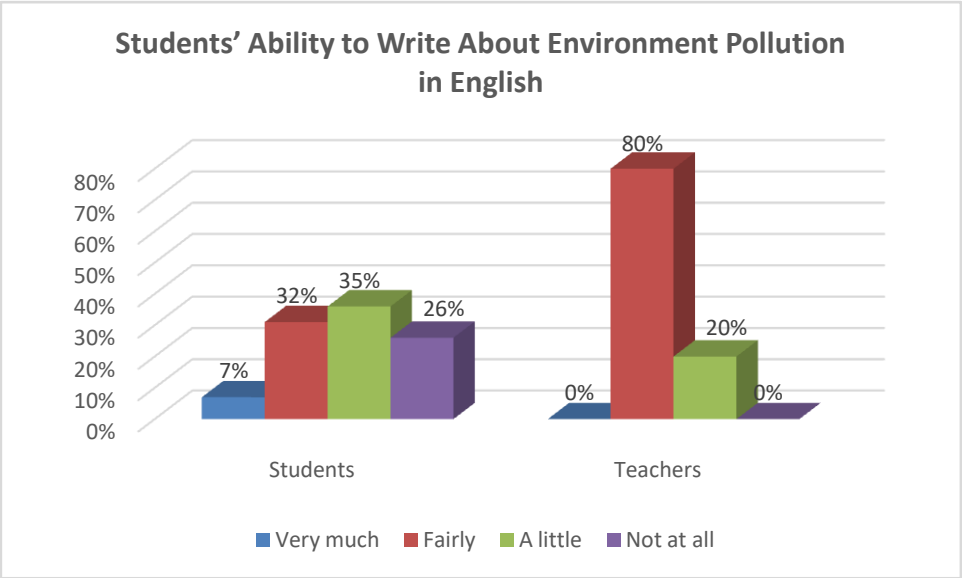

Figure 10: Students' ability to write about environment pollution in English

To conclude, topics related to environment pollution should be discussed more in the class by making it interesting and easier to meet the SDG that government is committed to fulfil.

Analysis and Discussion of Interview Questionnaire

4 teachers participated in the structured interview. Teachers participating in the interview are coded as T1, T2, T3 and T4 respectively to keep their identity confidential. The data obtained from the interview are discussed below:

Environment Pollution, Natural Disaster and Health related Lessons Easier and Enjoyable

These kinds of lessons are easier and enjoyable for students as they are related to our life. There should be more such lessons. “They are tough”, commented T4. Teachers thinking these lessons easier and enjoyable will tend to emphasize these lessons more for which teaching sustainability can be ensured but when teachers think these lessons to be difficult for students, they actually recommend revising such lessons, making teaching sustainability difficult.

Consciousness of Students about Environment Pollution and Natural Disasters

Students now-a-days are quite consciousness about environment pollution and natural disasters as they are taught by using multimedia to them the lessons easier. They also play roles in raising awareness of their family members. T4 replied in the negative which was also reflected by the responses of her students in the survey questionnaire.

Analysis and Discussion of Classroom Observation Data

The data obtained from the first-hand experience of classroom observation by the researcher is given below:

- Some students do not enjoy the class. Teachers involved different techniques like singing, cracking jokes, etc. seemed unfamiliar to students. However, students have a positive attitude towards learning, and they understand the lessons of *English For Today* Book. They can also speak English for basic communication and can write in English too.
- Teachers tries to make the lessons easier and interesting while teaching. Teachers use picture, video, poster, etc. in their class as directed in the curriculum. But it is done occasionally.
- In most cases, teachers are found to just read the text and give the activities provided in the textbook. They do not relate them with everyday life with different examples to make them easier, interesting and relevant. So, active participation of students in the class is not seen. Teachers are found to teach following

Grammar Translation Method. They were teacher dominating classroom with less scopes of question answer for students. Teachers were continuously translating from native language to target language. However, Direct Method was found to be applied sometimes.

Findings

The findings of the posed research questions are discussed below:

Alignment of the Contents of English For Today With ESD

Education for Sustainability (ESD) suggested some topics and stated that all topics and sub-topics related to all the Sustainable Development Goals (SDGs) are its range. Most of the lessons have the themes of ESD contents. And, as this research specified the topics related to environment as ESD contents, more than half of the lessons of *English for Today*, Book-V align with ESD which can be used for teaching sustainability to primary level students.

Pedagogy of Teaching at Primary Level

The Grammar Translation Method (GTM) and The Direct Method (DM) are used at the primary level as the pedagogy of teaching. Though all the characteristics of these methods are not followed or rigidly used rather teachers make some blending of methods while teaching. Though all four skills (listening, speaking, reading and writing) are practiced in the class more or less, they are not done effectively and are practiced occasionally for the sake of saying only. The pedagogy of teaching at primary level schools is not interactive and students' need and interest is not addressed. As a result, students do not enjoy the class and do not participate spontaneously in learning which impacts their learning process.

Application of CLIL for Teaching Sustainability in EFL Classroom

For teaching sustainability in EFL classroom, Content and Language Integrative Learning (CLIL) can be applied as students prefer contents that align with ESD. Therefore, if environment related contents are taught, they will feel interested, and the focus will shift from language learning to content learning. For the stress-free and participatory teaching environment, they can learn language better. Hence, language skills will be achieved by them along with the learning of contents. Besides, CLIL can be applied for teaching sustainability because students find some problems in their current lessons used in the class. So, if teachers simplify the lessons having sustainability topics and relate those with every-day life, they will enjoy it and CLIL also allows modifications of lessons according to the need of students. Provisions of the use of study materials if used properly, it would make the lessons even more interesting and the learning fruitful and that is how CLIL can be applied for teaching sustainability in English Language Classrooms.

Recommendations

Based on the data and insights found from the study, some recommendations for teaching sustainability in the English Language Classrooms are given below:

- Teachers should be given extensive training about the effective application of CLIL.
- Teachers' perception towards teaching sustainability should be positively changed and they themselves should realize its significance first.
- A guideline or guidebook of the adapted lessons or simplified lessons should be provided to teachers so that they can make the contents easier for students.
- As teaching sustainability in English language classroom is a bit challenging for teachers, the class duration should be more than half an hour.
- Teachers should overcome the barrier of competence they think students have.
- There should be flexibility in the syllabus, or it should be roughly tuned as teachers will require to adapt lessons according to students' need and interest.
- Use of study materials on a regular basis for holding students' interest.
- Students should hold on to the positive attitude they have for learning new things.
- Students need to participate actively for better understanding.

Conclusion

In a nutshell, teaching sustainability is demand of the time for facing challenges of this fast-pacing world. In order to meet the goal of SDG, there is no alternative to increase awareness through teaching sustainability which can be better done if exposed to such knowledge from early age.

More than half of the contents of *English for Today* align with ESD, opening the door for the application of CLIL. CLIL which needs contents from different discipline, can take the sustainability contents of the English textbook for teaching sustainability. As the current pedagogy of teaching used at the primary level is not very successful and students do not enjoy the classes, CLIL can be applied to make the classes enjoyable by shifting the focus to contents to ensure better language and sustainability learning. This will also ensure overcoming the fear students have for this subject, years after years.

Teaching sustainability through CLIL will increase students' eco-consciousness and thus make them prepared for facing challenges of the world.

Accordingly, for teaching sustainability effectively through the application of CLIL, teachers need to be trained. Supplementary books for the guideline of teaching can be provided to teachers along with the cooperation from students. Only then, teaching sustainability, the ultimate defense mechanism for the destructive global change can be achieved, in English language classrooms.

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Citizen Identity Management at the Bottom in Bangladesh: Some Learnings from a Piloting Project

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Abstract

This article provides a comprehensive exploration of Citizen Identity Management in Bangladesh, concentrating on grassroots dynamics through the lens of a piloting project. In the context of Bangladesh's ambitious initiatives, such as the Smart National Identification Card programme and the National Identity Registration Act 2023, the paper critically assesses the challenges and opportunities inherent in these efforts. With an increasing shift toward digitalization, the article underscores the importance of secure and privacy-conscious management of citizen information. Drawing lessons from the piloting project, the study aims to contribute nuanced insights into Citizen Identity Management, offering valuable perspectives for policymakers and practitioners in the realms of digital governance and identity systems. Focusing on the grassroots level, particularly within the Union Parishad framework, the article navigates through the complexities of implementing national identity strategies. This article contributes significantly to the discourse on citizen identity management in decentralized governance in Bangladesh. It advocates for a holistic and integrated approach, emphasizing the strategic use of existing databases, the adoption of Information and Communication Technologies (ICTs), and active citizen engagement.

Introduction

In a significant effort to enhance citizen identification and registry processes, Bangladesh has recently launched three pivotal programmes. Foremost among these initiatives is the inauguration of the Smart National Identification Card (NID) programme in 2016, envisioning the distribution of these cards to a targeted 100 million Bangladeshi citizens. Concurrently, the government has embraced a civil registration system facilitated through an online platform, aligning with the global imperative to implement Civil Registration and Vital Statistics (CRVS). Notably, in 2023, the government enacted the 'National Identity Registration Act 2023,' a legislative milestone mandating the issuance of a Unique Identification Number to all citizens. Under this legislative mandate, every citizen is assigned a Unique Identification Number, serving as a linchpin for accessing a myriad of services requiring identification. Furthermore, the government established

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the Bangladesh National Digital Architecture (BNDA) authority that is working as the apex body for developing strategies and an interoperability framework for e-governance. The BNDA produces a data architecture framework for data creation and governance.

Globally, the issue of identification has become a prominent focus on the development agenda (Gelb & Metz, 2017). Transformative advancements in identification technologies and the widespread adoption of e-service processes are reshaping the global identification landscape (Sedaghat, Pieprzyk & Seltsikas, 2007; Lips, Taylor, & Organ, 2009). The World Bank's 2022 Annual Report on "Identity for Development (ID4D)" highlights that approximately 850 million individuals globally lack official identification. Furthermore, the report emphasizes that a significant portion of this population resides in lower-income (LIC) and lower middle-income (LMIC) economies, predominantly in Sub-Saharan Africa and South Asia. The absence of official identification has far-reaching consequences, affecting individuals' access to essential services like financial services, government financial support, employment opportunities, and the ability to participate in elections (World Bank, 2022).

Bangladesh has also initiated various activities for civil registration and providing national identification cards to all its citizens. According to ID4D Data, 98.28% of Bangladeshi citizens aged 25 and older possess an ID card. However, among citizens aged between 15 to 25 years, only 53% have an ID, possibly due to the government providing National ID cards only to citizens over 18 years old.

As Bangladesh advances in its digital identity initiatives, a critical challenge confronting the government is ensuring the security, privacy, and integrity of the extensive repository of citizen information. Moreover, users of such systems must establish trust and confidence in online services to mitigate potential issues related to phishing or identity theft (Sedaghat, Pieprzyk & Seltsikas, 2007). This underscores the multifaceted dimensions and importance of identity management in the evolving landscape of digital governance.

In this context, the article explores the nuances of Citizen Identity Management in the specific context of Bangladesh, drawing insights from a piloting project. By reflecting on the learnings from the piloting project, this article aims to provide a nuanced understanding of Citizen Identity Management at the grassroots level, shedding light on the practical implications and lessons derived from this specific context.

Identity Management: Concept and Issues

The technological advancement in 21st Century is redefining the way humans do things as well as it is redefining the relationship between the citizen and government (Lips, 2008). In this technological regime, identity management play a critical role in the field of e-Government and e-

Business. It constitute the basic building blocks enabling secure and reliable access to online services from all kinds of service providers (Fioravanti & Nardelli, 2008; Beynon-Davies, 2007; Lips, Taylor, & Organ, 2009). An identity in the e-government age, mostly recognized as 'digital identity', represents an entity (may be a person or a service provider) in an ICT system. In the context of citizenship, digital identity represent a physical person in the digital domain (Jensen, 2017).Digitized IdM systems are not just perceived as facilitating government modernization but are also viewed as enhancing citizen services by providing improved customer convenience, citizen mobility, empowerment, trust, public service efficiency, effectiveness, and safety, including law enforcement (Lips, Taylor, & Organ, 2009). Lips and her colleagues identify digital identity management by the government as a 'social contract' between the citizen and government. It can protect both citizen and government from misinformation or information distortion. It also related to citizen rights and government responsibilities toward citizen (Lips, Taylor, & Organ, 2009).The 2005 European Union Ministerial E-Government Declaration included that 'as our e-government services become more transactional, the need for secure electronic means of identification for use by people accessing public services is essential for citizen trust and in ensuring the effectiveness and efficiency of our public administrations' (EU Ministerial Declaration on E-Government,2005). Scholars argued that digitized IdM not only facilitate government modernization but are also perceived as enhancing citizen services through improved customer convenience, mobility, empowerment, trust, and the efficiency of public service provision (Lips, Taylor & Organ, 2009). Therefore, Identity management refers to a framework of policies and technologies for ensuring that only authorized individuals can access the associated resources in an organization (Liu, et. al., 2020).

Identity management constitutes a crucial foundational element within the realm of information security (Akeem & Titilope, 2022). Scholars have expressed apprehensions regarding the growing reliance of organizations and service providers on electronic access mechanisms, as this trend concurrently amplifies the vulnerability to potential threats such as theft, fraud, and disruptions (Smith & McKeen, 2011). This heightened risk underscores the imperative for a comprehensive understanding and effective management of security measures to mitigate adversarial activities within the digital domain.

Moreover, scholarly discussions also accentuate the intricate relationship between citizen registration, record-keeping, and identity management with government sorting for societal benefit. However, in the context of digitized Identity Management (IdM) systems, especially those featuring central databases and biometric identifiers, scholar also shows concern for misuse of personal data, heightened government surveillance, and the potential for

discriminatory sorting of citizens based on factors such as ethnicity (Lips, Taylor, & Organ, 2009).

Therefore, an identity management, in digital age, defines a framework of organizational and technical standards and procedures for creating, storing, validating and using electronic attributes associated with the identity of a physical person. (Fioravanti1& Nardelli, 2008). According to International Telecommunication Union (ITU), relative to information systems, identity management (IdM) is the management of the identity life cycle of entities (subjects or objects) during which: the identity is established, the identity is described, and defined the identity is destroyed. This involves

- both technology and process
- managing unique IDs, attributes, credentials, entitlements
- the ability to enable enterprises to create manageable lifecycles
- the ability to scale from internally facing systems to externally facing applications and processes[1]

In summary, IDM in the digital age involves creating, storing, validating, and using electronic attributes associated with the identity of a physical person. It encompasses both technological and procedural aspects, managing unique IDs, attributes, credentials, and entitlements. Digital identity is all about personal information and setting up ways to confirm and check that info when using online services and doing transactions (Nyst, et.al., 2016). Scholars (Smedinghoff, 2015; Smith & McKeen, 2011; Nyst, et. al., 2016) Identified basic components of Identity Management (IdM):

a) ***Registration or Identification:*** These are processes that answer the question: ―Who are you? It involves associating one or more attributes (e.g., name, height, birth date, social security number, employer, home address, passport number) with a person in order to identify and define that individual to the level sufficient for the contemplated purpose. It typically involves collection of personal information about the person to be identified, which often relies on government-issued documents from birth certificates and Social Security cards to driver's licenses and passports or directly collected from the person being identified.

b) ***Authentication:*** the process of determining and ensuring the identity of an individual, addressing the fundamental question of "How can I verify that it is indeed you?" Typically in the digitized world, this involves:

[1] ITU Recommendation X.1252 (04/21), Approved in 2021-04-30. https://www.itu.int/dms_pub/itu-t/oth/15/04/T15040000010001PDFE.pdf and https://www.itu.int/rec/T-REC-X.1252-202104-I (Accessed 24/07/2023)

- Something the person knows (e.g., a secret such as a PIN, password or other secret

  code);
- Something the person possesses (e.g., a cryptographic key, an ATM card, a smart card,

  drivers license, or other physical token); or
- Something the person is (e.g., a biometric characteristic, such as a fingerprint or

  retinal pattern).

c) ***Authorization:*** These processes answer the question: ―What are you allowed to do or see? After successful authentication, the authorization process decides the user's permissible access and activities. Authentication confirms that an individual claiming a specific identity with associated rights is indeed that person, commonly occurring during each transaction, especially in online environments.

Identity Management (IdM) is like taking care of a persons or entity's online identity from start to finish. It includes creating, using, updating, and sometimes stopping the use of digital identities, and there are rules (policies) for each of these actions. Different organizations do these steps in different ways, affecting how much trust we can have in a digital identity. Bad actors can take advantage of weak points in any step of this process, putting information safety at risk (Jensen, 2013).For instance, in the first step, creating an identity involves registering, defining credentials, and finally giving them to the user. According to Jensen (2013), attackers have many reasons to manipulate the identity creation process, like pretending to be someone else when setting up a digital identity. So, in this digital age, managing identities needs careful steps to address issues like identity theft, using identities properly, regular updates, and following rules.

Local Government, Citizen Identity and Data for Development

In identity management ecosystem, along with secure data management practices, is crucial for the context of local government, effective identity management emerges as a linchpin for the successful implementation of personalized, digitally enabled, and customer-centric services. KPMG (2021) identified five key points regarding local government and identity management are:

- *Robust Ecosystem and Secure Data Management:* This ensures not only the protection of sensitive information but also fosters confidence among customers engaging with government services digitally.
- *Empowering Personalization: Identity* management serves as the cornerstone for delivering personalized government services. It

enables end-to-end service capabilities that empower customers to securely design their own customized experiences, meeting the expectations of today's digitally savvy citizens.

- *Balancing Innovation and Best-Fit Approach:* Local governments are advised to balance innovation with a best-fit approach. The goal of going digital should prioritize meeting diverse customer needs and service requirements rather than adopting technology for its own sake.
- *Utilizing Customer Data, Analytics, and Insights:* Redesigning services using timely customer data, analytics, and insights is crucial for improving responsiveness and efficiency.
- *Addressing Diverse Systems Challenge:* Local authorities face challenges in managing diverse systems and databases. Organizing and linking data on people and organizations is vital for enhancing personalized services and overcoming obstacles to executing effective customer strategies in local government (KPMG)[2].

Governments, whether operating at the national or local level, play a critical role in the management of identities to ensure the delivery of effective services and the attainment of efficient development outcomes. International organizations identified some areas where IdM systems can have an impact:

a. Development Planning

- Provides opportunity for governments to segregate population by geography, income, gender, age, etc., to identify target population for each initiative.
- Helps to prioritize programmes through better estimation of impact.
- Acts as an easy-to-monitor mechanism to check the effectiveness of programmes and/or initiatives

b. Service Delivery and Governance

- Helps to build a reliable population register and better performance analytics thereby improving efficiencies of the government and public sector entities.
- Helps to eliminate duplicate or ghost beneficiaries thereby reducing wastage in government expenditure.
- Aids in checking leakages in benefits delivery system by acting as an apparatus for the direct transfer of welfare benefits.
- Enables efficient public service delivery

[2]KPMG (2021). The future of local government. https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2021/07/the-future-of-local-government.pdf

c. Social Inclusion

- Lowers transaction costs for beneficiaries seeking toenter social security programmes and thus enables equalopportunities.
- Enables governments to create exhaustive and reliablebeneficiary databases.
- Provides mobility of identity across geography andservice domains.
- Enables new opportunities for improving delivery incritical sectors such as health care.

d. Financial Inclusion

- Helps financial institutions to easily perform Know Your Customer checks to establish identity.
- Empowers poor and underprivileged residents by enabling access to financial services.
- Aids in servicing residents in remote areas through services such as branchless and cardless banking.
- Helps to reduce cost of transactions through easy resident authentication process (ADB, 2016).

The effective management of citizen identity within the local government context is indispensable for delivering personalized, digitally enabled, and customer-centric services. As highlighted by KPMG, a robust identity management ecosystem, coupled with secure data management practices, serves as the linchpin for instilling confidence in customers engaging with government services digitally. In the broader spectrum, local governments play a pivotal role in contributing to the attainment of the "legal identity for all" by 2030, as envisioned by international initiatives. By leveraging IdM systems, local governments can efficiently target and prioritize initiatives, eliminate inefficiencies, ensure inclusive service delivery, and contribute to broader developmental goals.

Research Methodology

This article is based on a pilot project initiated to support the Union Parishadin realizing e-governance functions as stipulated in the Local Government Act (Union Parishad) 2009 (amended in 2011). The pilot project was launched leveraging the researcher's extensive training experience with Union Parishad functionaries and research background on local government institutes in Bangladesh and India. Initially, the researcher visited three Union Parishads in Sadar South Upazila, Cumilla District, Bangladesh, to assess the status of adoption of e-governance at the Union Parishad level.

The researcher conducted focus group discussions (FGDs) with Union Parishad Chairpersons and Members, held in-depth discussions with Union

Parishad Secretaries, and engaged with Village leaders. Additionally, a workshop was organized with the Chairpersons and Union Parishad Secretaries from 10 Union Parishads across five Upazilas in four Districts (Chattagram, Noakhali, Cumilla, and Brahmanbaria) in 2018, where the researcher presented the outcomes of the FGDs and observations.

In-depth discussions were also carried out with the Chairman of the Upazila Parishad and the Upazila Nirbahi Officer (UNO) of Sadar South Upazila, Cumilla. Furthermore, the researcher consulted with the Deputy Director, Local Government (DDLG), Cumilla, to gain insights into existing e-government initiatives for union parishad. These discussions provided an overview of the situation of e-governance at the local level.

Based on the findings, the project implemented a software solution, the 'Khana Profile Software,' to create Family Profiles and support the Union Parishad with a citizen database. Subsequently, the project collected family information from 60 villages in two unions, Bijoypur and Baropara Union, Sadar South Upazila, Cumilla District, spanning from November 2020 to May 2022. During this period, the researcher engaged with villagers in the village market/Bazar, roadside tea stalls, and individual villagers to understand their perspectives on providing personal and family information to the Union Parishad.

Villagers' comments on the issue were solicited, and they highlighted challenges related to National Identification Cards and Birth Registration. The findings from this participatory method offer insights into the online service process and the creation of digital identities for citizens in rural Bangladesh. These findings motivated the researcher to focus on citizen identity management and write this article to provide a first-hand idea for future research.

The Context: Local Government, and Identity Management in Bangladesh

The scenario of local government in Bangladesh is interesting. They are working as decentralized unit for administration, service delivery and development activities at the local level. However, they do not enjoy independence to work as it is mentioned in the Article 59 and 60 of the Constitution. The local activities including service delivery, development planning and budget is highly dependent on the national government. There are three types of local government institution in Bangladesh: urban, rural and hill local government institutions (LGIs). The urban LGIs include: 12 City Corporation and 329 Municipalities. The rural LGIs include: Zila Parishad (64), Upazila Parishad (492) and Union Parishad (4574). Among the three rural local government institutions, Upazila Parishad (UZP) and Union Parishad (UP) are more visible institutes in the service delivery and rural development context compare to Zila Parishad. Hill local government includes three zila parishads of three hill districts situated in the hilly eastern

part of the country. This research is related to rural local government institutions, particularly union parishad. Therefore, the following part will present a discussion on union parishad and it status in the data management in Bangladesh context.

The union parishad (UP) is the lowest tier of local government in Bangladesh and it is directly related to the day-to-day lives of the citizen. The existing Local Government (Union Parishad) Act of 2009, as delineated in Article 47, enumerates four principal functions (based on which detailed functions are included in the Second Schedule in the Act) designated for Union Parishad:

(a) Administer the activities of government officials at that level;

(b) Maintain public order and discipline;

(c) Provide services for public welfare;

(d) Plan and implement programmemes for economic and social development.

The second schedule of the Local Government Act 2009 has identified 39 works for the Union Parishad including introduction of e-governance at the local level. These functions can be divided into 12 sectors such as administrative and finance, maintenance of law and order, infrastructure development, rural development, agriculture, education, health, water supply and sanitation, social welfare, environment and forestry, trade and commerce, and culture, youth and sports (JICA, 2015, p. 9).

The Local Government Act of 2009 has introduced a system of open meetings, commonly referred to as Ward Sabha, which convenes twice a year. The primary objective is to involve the local populace in the decision-making processes and enhance the participatory nature of the Union Parishad (UP). These meetings are presided over by the elected representatives responsible for their respective wards. In accordance with the UP Act of 2009, the Ward Sabha is mandated to perform 21 distinct functions such as:

- collecting, organizing, and analyzing data about the ward to assist the Union Parishad.
- prioritize and implement various schemes and development projects.
- raise awareness about environmental and anti-social issues, violence against women and children, smuggling, early marriage, and inspire locals for self-employment.
- Reviewing/assessing the beneficiaries list for different government projects/programmes.

In summary, the significance of Union Parishad (UP) in local governance within the context of Bangladesh is pivotal, as it constitutes a direct nexus to

the daily experiences of citizens and assumes a crucial function in the facilitation of service delivery and rural development. The Local Government Act of 2009 delineates explicit responsibilities for Union Parishad, and the integration of Information and Communication Technologies (ICTs) emerges as a transformative avenue, specifically in the domain of identity management. This application proves instrumental for data-driven development planning, thereby ensuring judicious decision-making and fostering inclusive initiatives at the grassroots level.

Union Parishad, Adoption of ICTs and Digital ID Management in Bangladesh

This section offers a succinct overview of the incorporation of Information and Communication Technologies (ICTs) in Bangladesh, specifically pertaining to digital identity management. Drawing from the researcher's firsthand experiences as a scholar and trainer specializing in e-governance and local government affairs in Bangladesh, the narrative is supplemented by an exhaustive desk review of diverse government websites and pertinent publications from key agencies such as A2i and the Bangladesh Computer Council (BCC). Additionally, on-site visits to various union parishad further enriched this comprehensive evaluation, contributing to an enhanced comprehension of the contemporary status of ICT adoption in service delivery and the management of citizen identities.

National Information Portal

In regards to adoption of Information and Communication Technologies (ICTs) or introduction of e-governance, the country followed a top-down approach. Means the national government initiated a “Digital Bangladesh” movement in 2009 to encourage government agencies and citizen to accept and adopt ICT aided service system. The government of Bangladesh (GoB) introduced National Portal for providing information regarding the public services, policies and activities of the government to citizen. As per the rules of the national portal, every public agency at every administrative level have a page. From upper level to lower level, such as follows:

Division > District > Upazila > Union > Department/Agency

Union as administrative tier have a web page in this portalwhere union parishad as agency have their page. This is a static web-page which only provides information such as brief information of the union, village wise population, communication system, history and tradition, Information of Union Parisahd includes its organogram, information about the Chairman, Members and UP secretary (designation, mobile no, email address), Information on Social Security Programmes (SSP) and more. In regard to social security programme, the portal only published the final list of the beneficiaries for SSP. Unfortunately, the existing beneficiary selection processis criticized being politically biased and corrupt (Rahman Rizvi, 2020). Currently beneficiary selection process used perception of elected

representatives and village elites about a villager income, age and other relevant issues. In this case, IdM can increase the efficiency of selection process.

Online Services via Union Digital Center

The Government also introduced tele-center or one-stop service delivery outlet at every union to provide information and services to the rural people. They are popularly known as Union Digital Center (UDC), which is situated in the union parishad office building. The Government also established similar digital center (DC) in Pourashabha (Municipality) known as PDC and City Corporations known as CDC. According to the Digital Center Management website[3] (as of January 2024) currently 5275 UDCs, PDCs and CDCs are actively providing services to the citizen.

Digital centers provide 106 type of services to the citizen including birth-death registration, passport application and payment for passport, telemedicine, application for citizenship certificate, Land Record (Porcha), online registration for potential migrant worker as well as application to various other government services and private services (mobile financial services, insurance etc.) (A2i, 2016; A2i, 2018). These services can be divided in the following ways:

a. Government services such as government information services, passport application and payment for passport, land record, interactive services received include overseas job application, education services, and consultation with doctors through phone or video call (telemedicine), Government Forms etc.

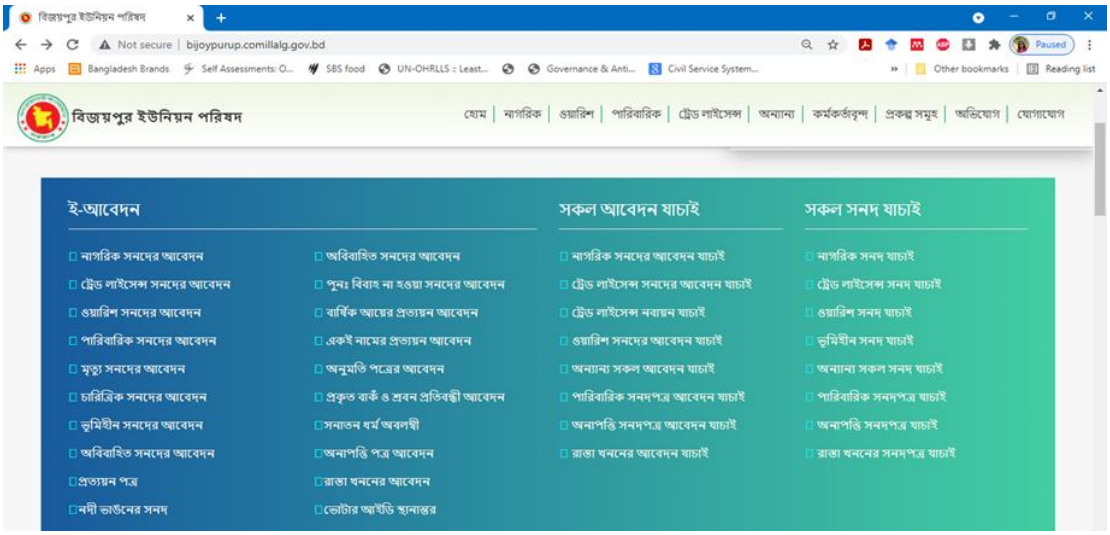
b. Local government services or certificates i.e., include certificates (birth), computer compose and photocopying, and

c. Commercial Services i.e., include email/internet browsing, education services (admission/registration/result check), photoshoot, job search/application, computer training, phone call/projector rent/song load and others (flexi load (mobile top-up system for Grameen Phone), data entry, laminating, mobile servicing, laminating, video conference, etc.) (Faroqi and Siddiqui, 2017).

Online Service Platform from the District Administration

In another research, this author found that union parishad uses one online platform or web portal to provide services to the citizen (Sultana, et.al., 2023). Union citizen can apply for at least 19 types of certificates such as citizenship certificate, family certificate, inheritance certificate, trade license, etc. The following picture is a screen shot of the mentioned portal.

[3] http://dcms.e-service.gov.bd. Accessed 26/01/2024



This platform reduced number of visits to union parishad (UP) for the citizen. In this way, it has also reduced cost of visits for the citizen. This research found that the reduction of citizen visit to union parishad is supportive for the office environment for the UP office bearers. Union Parishad office is now quitter compare to before 2018. This online platform has worked well in the Covid-19 pandemic situation. According to the UP Chairman and Secretary, less people in the office means less threat from covid-19. However, there are following challenges also:

- This is an online platform and UP officials can only work online. No scope for offline work. The UP officials said that they use mobile data because broadband line is not working in the union. Therefore, they need to buy mobile phone data, which is costly for Union Parishad. There is no financial allocation for buying mobile data.
- Another problem with this platform is that it cannot support the load of online entry of all the 193 Union Parishad of Cumilla District. Mobile data network is slow.
- However, they are trying their best to provide services to the citizen via this online platform. The slow connection of mobile data made them to start working in the early morning like 3 am or 4 am. This increases their working hours.
- Server down is another problem for them. The server for birth-death and marriage registration is maintained by the Office of the Registrar General, which is located in the Capital city, far from union parishad office.

The researcher reviewed this online platform and found that:

- The online application process via this platform is creating a citizen database, but not the full population database.
- The database stores limited data of individual citizen, not their full family data. This database is storing information of those who apply for a service.

- People apply for particular certificate or licenses, which have customized format based on each certificate or license's requirement.
- This means it is creating a citizen database but not the profile data of a citizen. Means it does not clarify the family relationship. Full family profile data is important for union parishad to provide inheritance certificate and land record system.
- Nor it is creating any database of resources of the union. Both information regarding household and union resources are important for union development planning and budget.
- A complete citizen database with family information and wealth or income information could support the union parishad to identify the vulnerable citizen for social security programmes.
- Though this platform is creating one big database, but there is no scope for re-use the data for different purposes. Union Parishad does not have access to this database for reuse as it is controlled by the office of the District Administrator, i.e., Deputy Commissioner's office in Bangladesh context.

Civil Registration and Vital Statistics (CRVS)

Registering citizen or Civil Registration at birth is an essential activity of a country and it is a right of a citizen. Acknowledging international commitment of citizen registration 'Make Every Life Count', the Government of Bangladesh renewed its commitment for civil registration and make the process efficient and easy for citizen. Though Bangladesh's journey towards birth-death-marriage registration started under the British rule in 1873, the country renewed its focus towards CRVS by enacting the Birth and Deaths Registration Act in 2004, which came into force in 2006 (Bangladesh Implementation Working Group, 2018). This act made birth and death registration compulsory within 45 days of the vital event, and made registration of all vital event of all citizen is a matter of law and an individual legal right. Bangladesh renewed its commitment towards CRVS in 2010 that support the vision of international community. Therefore, the Government of Bangladesh established a central online digital system for birth and death registration, which is known as Birth Registration Information System (BRIS), which is now active in all 64 districts since 2013.

In the CRVS system, local government institutes plays vital role. In rural areas, union parishad is responsible for compliance with the registration process and creation of relevant data records and documentation. This research found:

- Birth registration as a one of the everyday activity of the UP Chairman, Secretary and the UDC.

- UP officials are busy with birth registration, but they do not upload birth certificates in the BRIS immediately.
- Another gap is lack of integration of CRVS with UP service delivery process. Therefore, UP cannot re-use the personal information for service delivery purposes.

Digitization of National Identification in Bangladesh

The National Identification (NID) Card, which was introduced as Voter ID Card, has created another citizen database. The Smart NID Card system was installed in 2016 which included biometric (finger and eye) for authentication. This is a big database, which can be re-use for different services. Government already using this system many services and also given permission to private sectors such as banking system, and SIM card registration for biometrically verify the customers. However, the union parishad is not integrated with the NID database for the services from Union Parishad.

This analysis highlights the existence of three identifiable databases within reach of the union parishad for potential reuse. Despite this, the exploration of this domain is notably limited in the context of Bangladesh. This article endeavors to offer a foundational rationale for bottom-up identity management.

The Piloting Project on E-parishad for Better Service Delivery

Recognizing the transformative potential of ICTs and to develop a replicable e-government model for union parishad, in 2020this researcher initiated on piloting/experimental project titled as "E-Parishad for better service delivery at the village level"with the funding from Bangladesh Academy for Rural Development (BARD). The general objective of the piloting is to improve the citizen personal information management system and e-governance in union parishad. The specific objectives are:

- Create Union Khana Profile database to improve service delivery process of the Union parishad
- Support union parisahd with necessary data for yearly and five yearly planning
- Help the union parishad with Identity Management (IdM) at the local level

To achieve the objective, we adopted two component for improving the service delivery process of the union parishad. In the first year, we dedicated our project activities in making a ‘Khana Profile Software” to register all the citizen based on the *khana*or family and create a Union *Khana* Profile Database. The Academy allocated minimum funding for the project, therefore, at first we tried to develop the software and conduct the survey in 10 Villages in October 2020 to January, 2021. At the beginning

we recruited 10 youth from the 10 villages considering the Covid-19 movement restriction, but finally we use 15 data collector from two project area. However, in the next two financial year we completed information collection of 13000 family information from all 60 villages of two project area, i.e., Bijoypur and Baropara Union, Sadar South Upazila, Cumilla. The following part will provide learnings from the implementation of this component and try to discuss the necessity of identity management at the lowest administrative tier in Bangladesh.

Learnings of the Piloting Project

Learnings from the Interviews, Discussion and Visits to Union Parishad and Villages Prior to Information Collection Survey

In the piloting phase, we dedicated project activities towards establishing the Khana Profile Database, aimed at facilitating identity management within the Union Parishad. Throughout this process, significant insights into the concepts and challenges associated with Identity Management (IdM) in Bangladesh, particularly at the local government level, have been garnered, which are as follows:

- The Union Parishad requires comprehensive information about its citizens and their households to facilitate service provision, conduct household tax assessments, engage in development planning, design projects, furnish pertinent data to higher administrative authorities, and identify vulnerable populations for inclusion in social security programmes.
- The Union Parishad diligently upholds a Ward-based household register book designed for the purpose of tax assessment. The ensuing illustration encapsulates the conclusive manifestation of this register book.

ইউনিয়ন পরিষদ আদর্শ কর তফসিল, ২০১৩ অনুযায়ী বিজয়পুর ইউনিয়ন পরিষদের ওয়ার্ড ভিত্তিক এসেসমেন্ট তালিকাঃ

ইউনিয়ন : বিজয়পুর — ওয়ার্ড নং: ০১ — গ্রাম: রাজার খলা

ক্রম নং	মালিকের নাম	পিতা/স্বামীর নাম	পেশা	নং খতিয়ান ১	জমির পরিমাণ		নাল/নাল সেচযুক্ত	নাল/নাল	অন্যান্য ফসলী জমি	অন্যান্য অফসলী জমি	পাকা	আধা পাকা ২ তলা বিশিষ্ট	আধা পাকা ১ তলা বিশিষ্ট	বাড়ীর বর্ণনা				বাড়ীর আনুমানিক মূল্য	টালির ঘরের সংখ্যা	টিনের ২ তলা বিশিষ্ট ঘর	টিনের ১ তলা বিশিষ্ট ঘর	মন্তব্য
					দাগীয় জমি	খতিয়ান নং								টিনশেড	টালি শেড	দালান	খোলাটং ২					
০১	মোঃ মানিক মিয়া	মৃতঃআঃ হাকিম	ব্যবঃ	০১	নাই	৮শ	হ্যাঁ	হ্যাঁ	১	১	১	১			৪			৬,০০০০০	১৮০০০	৬০০	৫০০	
০২	এরশাদ	ঐ	প্রবাঃ	০২	নাই	৮	হ্যাঁ	হ্যাঁ	১	১	১	১			৩			৪,০০০০০	১২০০০	৪০০	৪০০	
০৩	জসিম	ঐ	প্রবাঃ	০৩	নাই	৮	হ্যাঁ	হ্যাঁ	১	২		১					৫	২২,০০০০০	৬৬০০০	২২০০	৫০০	
০৪	আবুল হোঃ	মোঃ ফজর আলী	কৃষি	০৪	২০শ	১৪	হ্যাঁ	হ্যাঁ	২	২	১	২			৩			৪,০০০০০	১২০০০	৪০০	৩০০	
০৫	মিজান	আবুল হাসেম	কৃষি	০৫	১২	৮০	হ্যাঁ	হ্যাঁ	২	২	৩	১					২	১,০০০০০	৩০০০	১০০	১০০	
০৬	শাহজাহান	মৃতঃ মোহর আলী	দিনমঃ	০৬	নাই	৪	না	হ্যাঁ	১	১							১	৭০০০০	১৫০০	১০০	১০০	
০৭	মোস্তফা কামাল	মোঃসোবাহান	চালক	০৭	নাই	২০	হ্যাঁ	হ্যাঁ	২	১							১	৭০০০০	১৫০০	১০০	১০০	
০৮	সাইদ মিয়া	মৃতঃ কাজীপুরুল	চালক	০৮	নাই	৭	না	না	১	১	২	১					১	১২০০০	১৫০০	১০০	১০০	
০৯	সোবাহান মোল্লা	মৃতঃ আঃ মজিদ	ব্যবঃ	০৯	নাই	১২শ	না	হ্যাঁ	২	২	২						১	৪৮০০০	১৫০০	১০০	১০০	
১০	শরিফ হোসেন	মোঃমাজিদুল ইস লাম	ঢাকস্থী	১০	নাই	১৪	না	হ্যাঁ	১	১	১			১				১০০০০	৩০০	১০০	১০০	
১১	সুজন মিয়া	আলী আশ্রাফ	ব্যবঃ	১১	নাই		হ্যাঁ	হ্যাঁ									১	১০০০০	৩০০	১০০	১০০	
১২	মতিন	মৃতঃ জব্বার মিয়া	ব্যবঃ	১২	৮২	৫০	হ্যাঁ	হ্যাঁ	৩	৪	২	১			৪		১	৫,০০০০০	১৫০০০	৪০০	৪০০	
১৩	আনোয়ার হোঃ	মৃতঃ কালা মিয়া	ব্যবঃ	১৩	নাই		না	না	১	১	১	২					১	১০০০০০	৩০০০	১০০	১০০	
১৪	আলী আশ্রাফ	মৃতঃ মোনা মিয়া	কৃষি	১৪	নাই	২	না	না	১	১	২	১					১	৭০০০০	২১০০	১০০	১০০	
১৫	মোঃ করিম	আলী আশ্রাফ	দিনমঃ	১৫	নাই		না	না	১	১		২	১	১				২০০০০	৬০০	১০০	১০০	

The depicted union household register books serve as repositories for essential information pertaining to households. This archival system meticulously captures details including the name of the Household

Owner (HO), the paternal or marital nomenclature of the HO, the HO's profession, household number, land ownership particulars, tube well and sanitary latrine possession, household demographic information based on age, house description, selling price of the house, yearly tax assessment, and the determined tax amount predicated on the assessment. These register books assume a pivotal role within the Union Parishad. Regular utilization of this register is observed, primarily by the Secretary, who relies on its contents to furnish household numbers to service recipients. Notably, oversight or forgetfulness on the part of applicants regarding their household number is mitigated through the use of this register.

- The introduction of the online Union Parishad (UP) platform for service applications is a commendable initiative directed by higher authorities. The online application process contributes to the establishment of a citizen identity database, albeit limited in scope. Tailored to specific certificates or licenses, the application process lacks clarity on family relationships, hindering holistic development planning and budgeting for the Union Parishad. While the platform consolidates data, its restricted accessibility by the office of the District Administrator limits its potential for diverse applications or reuse by the Union Parishad.
- In Bangladesh, both the Civil Registration and Vital Statistics (CRVS) and the National Identity Card (NID) database are active. The Union Parishad plays a pivotal role in registering births and deaths but lacks direct access to these databases, remaining non-integrated with them.
- Discussions with villagers reveal challenges with the National Identification Card, particularly the 2008 "Voter ID Card." Villagers provided personal information without understanding its future applications, leading to challenges like inaccurate birth dates. Informal practices and discrepancies pose challenges for obtaining the Warisan certificate, exacerbated by the absence of a formalized mechanism for identifying family members.
- While traditionally, UP representatives were believed to possess intimate knowledge of villagers, this understanding is becoming vague. Families residing outside the union face challenges obtaining certificates, highlighting evolving dynamics in local governance.
- The adoption of online services increases working time for UP staff, but slow internet connectivity poses challenges for prompt service delivery. In Cumilla's UP, mobile phone networks are commonly used, with staff occasionally uploading certificates in the middle of the night due to slow internet.
- The challenge in utilizing information and communication technologies to enhance service delivery at the local level stems from

a lack of comprehension among UP representatives and UP Secretaries regarding e-governance, the utilization of digitally created citizen identity databases, and pertinent policies and strategies.

Learning from the Survey for Khana Profile Database

Enhancing Service Delivery through Integration: Horizontal and Vertical Integration

The Khana Profile Database has the potential to significantly improve service demand and delivery by integrating horizontally and vertically with databases or software of other local government and public organizations. This collaborative approach can enhance coordination processes in Bangladesh.

Contribution to SDGs

Integration with upazila and district level organizations would empower the Khana Profile Database to contribute valuable data for Sustainable Development Goals (SDGs), supporting broader regional development initiatives.

Addressing Connectivity Challenges: Offline Databases for Local Government

In areas with slow or unreliable internet connectivity, the implementation of offline databases is essential to facilitate internal service processes within local government institutions.

Overcoming Information Hesitancy: Importance of Identity Management

Individuals may hesitate to provide information due to a lack of understanding regarding the significance of identity management by Union Parishads or public organizations. Awareness-raising activities, such as organizing ward or village meetings, are crucial for overcoming this issue.

Supporting National Systems: Role in Inheritance and National ID System

The Khana Profile Database can play a supportive role in addressing inheritance issues and contributing to the effectiveness of the national ID system.

Mobilizing for Data Collection: Youth Engagement

Involving youth from the local community in data collection processes can enhance efficiency and reliability, tapping into their familiarity with the area.

Elected Representatives as Advocates

Engaging elected representatives is key to persuading citizens to share information. Training them on digital Bangladesh, e-government, and

technology use in local government is crucial, as many representatives may be unaware of the associated benefits and risks.

Ensuring Data Integrity: Frequent Software Updates and Backup

Frequent updates to the database software are essential for maintaining data integrity. Establishing a robust backup database is equally crucial to minimize corruption within local government institutions, as highlighted by instances of multiple issuances of birth certificates despite an integrated system in place.

Conclusion

In conclusion, this journal article thoroughly explores citizen identity management at the grassroots level in Bangladesh, specifically focusing on the crucial role of Union Parishad in local governance. The insights presented result from a comprehensive analysis encompassing the legal framework, local government structure, and the integration of Information and Communication Technologies (ICTs) in service delivery. A key emphasis is placed on the management of Khana/Family profiles as a vital element in local-level digital identity management.

Highlighting the significant role of Union Parishad as the lowest administrative tier in Bangladesh, the article underscores the transformative potential of ICT adoption, particularly through online services and the National Information Portal. While these initiatives create databases on citizen identity, their untapped potential for enhancing grassroots-level service delivery is discussed. Challenges related to data integration, accessibility, and reusability currently hinder the efficient utilization of these databases by Union Parishads. The article critically examines the existing identity databases, emphasizing their limited use and advocating for their untapped potential in improving service delivery processes and reducing information collection costs. It reinforces the pivotal role of local government institutions in effective digital identity management.

Moreover, the article sheds light on challenges such as citizen reluctance to share personal information, discrepancies in existing databases, and the dynamic nature of local governance. Overall, it contributes to the discourse on citizen identity management within the framework of decentralized governance in Bangladesh. The need for a holistic and integrated approach is emphasized, urging the strategic utilization of existing databases, thoughtful adoption of ICTs, and citizen engagement. The article also underscores the importance of capacity building and improved networking at the local level for full ICT utilization, aiming to enhance identity management from the bottom up. The presented piloting project serves as a valuable case study, offering insights that can guide future endeavors focused on improving service delivery and governance processes at the grassroots level in Bangladesh.

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The Public Service Commission in Bangladesh

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Abstract

The Public Service Commission (PSC) is a constitutional authority tasked with selecting qualified applicants for the Bangladeshi public service through a competitive exam known as the BCS Examination. Additionally, it provides advice to governments on issues relating to recruitment, promotion and service rules. Due to some interference from the bureaucracy and politics, this statutory authority is unable to effectivelyperform its duties. For the past few years, the PSC has been the focus of attention and debate. This constitutional body has been swamped and had its reputation tainted by the influx of claims of corruption and politics. Additionally, accusations of prejudice have been raised against the PSC's chair and members. Therefore, it is crucial to foster a favourable environment so that the PSC can carry out its constitutional mandate free from obstruction.

Keywords: Bangladesh,Constitution, Civil Service, Cadre Service,BCS Examination, Recruitment

Introduction

The Public Service Commission (PSC) is one of the important constitutional bodies in Bangladesh with a colonial past. It finds a place of pride in theConstitution in Part IXof Chapter II in Articles 137–141.The country is largely dependent on the civil service whichconstitutes the steel frame of our democratic edificeand the PSC has the constitutional authority and powers granted to it for the recruitment of eligible personnelfor the service through a competitive examination, the Bangladesh Civil Service Examination, widely known as the BCS Examination.This study aims to understand the historical context of the PSC, its present situation, and its problems while also offering some recommendations. More specifically, this essay primarily focuses on the role of the PSCregarding the BCS Examination.

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In Bangladesh, the Ministry of Public Administration (MOPA) and the PSCare the two central personnel agencies thatdeal with therecruitment of civil servants. While the PSC is responsiblefor conducting the civil service examination to recruit fresh personnel the MOPA finalizes the selection and appointment of the fresh recruits to the service. Additionally, the Ministry of Law, Justice and Parliamentary Affairs (MOLJ&PA) and the Ministry of Finance (MOF) are involved with the civil servicerecruitment and selection process. The MOPAis in charge of regulating all crucial facets of personnel administration, including hiring, training, posting, promotions, career development, disciplinary actions, employee welfare, retirement benefits, performance reviews, pay, and employee motivation and thePSC is tasked with selecting class -I gazetted officers for the civil service cadreposts through competitive examinations. In addition, the PSCrecruits class-II gazetted officers for Bangladesh civil service.The PSC also participates in the decision-making process for other service-related issues in government services, such as employee disciplinary affairs, posting, and appeals. However, the role of the PSC is mostly advisory and it lacks any executive power.

Method

The PSChas significantly aided in fostering excellence in the nation's future public administration by recruiting new employeesto the service. However, there are debates and controversies regarding the standard of the BCS Examination. Scholarships focusing on the role of the PSC regarding the BCS Examination are scarce in Bangladesh. Moreover, available literature dates back one to three decades. For example, Ahmed (1986; 1990); Ali (2002); Khan (2005); Institute of Governance Studies (2007) and Karim (2007) centered on the emergence, evolution, structure, functions, and operational issues of the PSC.

During the 1990s and 2000s,there had been state-wide discussion and debate concerning the role of the PSC. The credibility of this constitutional body had been tarnished by allegations of question leakage, corruption and politicization. The PSCChair and Members had also been charged with misconduct. There was dissatisfaction and distrust among people regarding the BCS Examination. Demands from various sectors of society for reforming the BCS Examination and introducing laws to punish the culprits were getting stronger. Accordingly, some steps have been initiated to reform the BCS Examination. Very recently the Government of Bangladesh has introduced the PSC Act 2023 with the provision of punishment for any misconduct or ill practices in the BCS Examination. The lack of recent research on the role of the PSC in relation to the BCS Examination has left a void that this study aims to fill.

In doing so, this study has given emphasis mostly on desk research. The empirical information for this researchwas collected through available

literature reviewincluding constitutional and legal documents, books, academic journal articles, local and international publications, newspapers, and the internet. Besides,open-ended interviews with the help of a semi-structured questionnaire were conducted to obtain primary information from 15 participants; three ex-members of the PSC, three academics, fourcivil servantsand five candidates who were rejected after viva.Emails and phone calls were used to make arrangements for the interviews. The goal of the research was emailed to the participants after we had obtained their permission to include them in the study. They were also told that their opinions would be examined and published as research publications. A further assurance was made that participants' identities would not be revealed by the data they gave.

Historical Antecedents of the Public Service Commission in Bangladesh

The Pre-Independence Period (British India and Pakistan Era)

The idea of a merit-based contemporary civil service in India was first proposed in 1854 as a result of Lord Macaulay's Report of the Select Committee of the British Parliament, which sought to replace the patronage system of the East India Company. Accordingly, a Civil Service Commission was established in Londonin 1854 and competitive examinations were introduced in 1855. In India, the PSCcan be traced back to the Government of India's first despatch on the Indian Constitutional Reforms on 5 March 1919, which discussed the need for creating some permanent offices tasked with overseeing service-related issues. Section 96(c) of the Government of India Act, 1919 later referred to it. The PSC was established on 1 October 1926 as per the suggestions made in the Lee Commission Report of 1924. A PSC for the federation as well as a Provincial Public Service for each province or set of provinceswas envisionedunder the Government of India Act of 1935.The PSC was renamed the Federal Service Commission on1 April1937. The Federal PSC became known as the Union PSC under Article 378(1) with the adoption of the Constitution of India on January 26, 1950(Ghosh, 2018, p. 733).

British India was divided in 1947 into two states: India and Pakistan. The eastern region of Bengal became the Eastern Province of Pakistan, known as East Pakistan. The other part was known as the Western Province of Pakistan, namely West Pakistan. Following the guidelines of the Government of India Act 1935, the Government of Pakistan established the Pakistan PSC, which was joined by three provincial PSCs in East Pakistan, Sind, and a combined commission for Punjab and the North-West Frontier Province.With the 1962 constitution, the Central PSC, as it was renamed, was given the duty of administering examinations and tests for appointment to positions in the central government. It was also tasked with providing advice to the President on any matters in the administration for which the PSC was to be consulted(SAARC, 2014, p.75).

The Post-Independent Era: BangladeshPublic Service Commission

Bangladesh became independent in 1971 after a nine-month bloody war against Pakistan.The Bangladesh PSC Order (President's Order number 34 of 1972) published on 8 April 1972 created two commissions; the Bangladesh PSC (First) and Bangladesh PSC (Second). The Bangladesh PSC Ordinance 1977 merged the two PSCs and the present-day Bangladesh PSC was formed (SAARC, 2014, p. 40).

Currently, the PSC operates following articles 88, 137, 141, and 147 of the Bangladesh Constitution, as well as the Bangladesh PSC (Consultation) Regulations, 1979 (Amendment) (PSC, 2017, p. 1), the Bangladesh PSC Act2012, the Members of the Bangladesh PSC (Terms and Conditions of Service) Act 1974 as periodically updated (SAARC, 2014, p.40) and Bangladesh PSCAct 2023(Government of Bangladesh, 2023, p. 1259).

The PSC consists of a Chairman and six to 20 Members (Government of Bangladesh, 2023, p. 1260). The President appoints the Chairman and other Members of the PSC as per Clause (1) of Article 138 of the Constitution, which specifies that not less than 50% of the Members of the Commission have served for a minimum of 20 years in any government service that has ever operated within the jurisdiction of Bangladesh. According to clause (2) of the same article, the President of the Republic may, by order under any law passed by the Parliament, set the terms of employment for the Chairman and members of the PSC.The terms of office for the Chairman and Members of the PSC are outlined in Article 139 of the Constitution and are five years from the date of their joining or until they turn 65, whichever comes first. The Chairman and other Members may only be dismissed from office similarly and for the same causes as a Supreme Court judge. Charges to the government's consolidated fund are used to pay the Chairman's and Members' salaries. The Chairman and other Members take their seats after taking their oaths according to the provisions of Article 148 of the Bangladesh Constitution (PSC, 2022, p.3).

Functions of Public Service Commission

Article 140 of the Constitution of Bangladesh lays out the fundamental tenets of the PSC in precise language. The PSC is mandated by the article to

> (a) arrangeexaminations and assessments to identify eligible applicants for recruitment to the publicservice;
>
> (b) provide advice to the President on any topic regarding which the commission consults under clause (2) or on any matter about its functions that the President refers to the commission;and
>
> (c) perform any extra responsibilities assigned by statute (PSC, 2022, p. 1; MOLJ&PA, 2016, p. 50).

According to Clause 2 of Article 140, the President must consult thePSC regarding

(a) topics relating to requirements for and procedures for recruiting into the government service;

(b) requirements to be fulfilled when selecting candidates for government service, their transfer and promotion, and evaluating individuals to see if they are suitable for such appointments, promotions, and transfers;

(c) matters impacting the terms and conditions of the service (including individual rights);

(d) the disciplinary measures of the service (PSC, 2022, p. 1; MOLJ&PA, 2016, p. 50).

However, arranging the BCS Examination to recruit candidates for the Bangladesh Civil Service is the primary function of the PSC.

Civil Service System in Bangladesh

There are four classes of employees in the Bangladesh Civil Service: class I, class II, class III, and class IV.Moreover, two further groups of civil servants can be distinguished: gazetted and non-gazetted; Class I and a section of Class II officers are gazetted officers with enhanced rights, duties, and privileges, while the rest are non-gazetted officers with comparatively lower status. The service is further split into two categories: cadre and non-cadre. Only a relatively small percentage of civil servants work for the cadre services within the public service. Class I cadre positions are divided vertically into six levels according to seniority and status: secretary, additional secretary, joint secretary, deputy secretary, senior assistant secretary, and assistant secretary.

Bangladesh uses a closed entry system, in which class I officials are hired directly into the cadre services after passing an open competitive examination known as the BCS Examination, which is held by the PSC for positions such as assistant secretary and comparable ones. The cadres are separated into general cadres and technical/professional cadres following the required educational requirements (Ara, 2023, p. 690).

Bangladesh Civil Service Examination at a Glance

BCS Examination is conducted in three steps:

1. Firstly, apreliminary assessment of two hours in which a Multiple-Choice Question (MCQ)-type examination of 200 marks with 200 questions is conducted to shortlist the candidates for the written test.Since the 35th BCS, a 0.50 mark penalty has been implemented for each incorrect response given in the MCQ test to ensure that no candidates get an unfair advantage by guessing their answers (Ara, 2023, p. 692).
2. The next step is the written test worth 900 marks for applicants who passed the preliminary examination. A candidate is deemed to have

received no number if their written exam score was lower than 30%. Additionally, two examiners from the 38th BCS Examination have been assigned to review the answer sheets. The answer sheet must also be reevaluated if there is a 20-point or greater difference in the marks given by the two examiners. Candidates who want to be considered for both general and technical/professional cadre positions must take a written exam with 900 marks in general cadre requirements and 200 marks in the subject(s) relevant to the additional positions or services. Each subject has a four-hour time limit and carries 200 marks. Three hours are allotted for a subject that is worth 100 marks. A passing score on the written test is 50% (Ara, 2023, pp. 692-693).

3. Finally, a 200-mark oral assessment for those who passed the written test. For the oral exam, a score of 50% is required to pass (Ara, 2023, p. 693)

Challenges tothe Functioning of the Public Service Commission: Current Status and Recommendations

The importance of the PSCin the smooth functioning of the state machinery hardly needs to be over-emphasized. However, it does not seem that all is well with this body. Historically, during the British era, a convention was followed where the advice of the PSC was generally accepted. During the Pakistan period, the authority and independence of the PSCwere limited. The situation became worse after the independence of Bangladesh. It almost became a custom for the government not to pay any attention to the recommendations of the PSC. For instance, it took the PSC ten years to make the government understand the importance of a simple modification of the quota reservation policy.

Theoretically, the PSC, as a statutory body, can carry out its tasks and responsibilities without interference from individuals or organizations in the legislative and executive branches of the government, as well as from people and institutions outside the government.Nevertheless, its position as an independent constitutional body seems to have been circumscribed as it is dependent on the MOPAforinitiating recruitment procedures.

In Bangladesh, two organizations are largely responsible for recruiting and selecting cadre officers -the MOPAand the PSC. Operationally, the regulation wing of the MOPAprepares as well as examines the recruitment rules,and prescribes the method and criteria for recruitment before forwarding to the PSC. It is noteworthy that each ministry or division can formulate its own hiring regulations and execute them with the consent of the MOPA. As a result, the PSC must wait to initiate recruiting until it receives the list of vacancies from the MOPA. An ex-member of the PSC stated thatwhen giving the Commission the list of vacant positions, the MOPA frequently causes needless delays. They occasionally alter the total

number of vacant positions that they had originally requested. The PSC thus encounters numerous difficulties, which finally causes the recruiting process to be delayed.

Finance is necessary to perform the functions given to the PSC. However, the PSC cannot directly submit the budget to the MOF, the final authority to approve the budget.The MOPAforwards the budget on behalf of the Commission to the MOF. A senior civil servant working at the MOPA said thatbudget submission is a routine matter and the MOPAor MOFnever interfered in the financial matters relating to the PSC. However, an ex-member of the Commission has stated that the financialdependency ofthe PSCmakes it sometimes difficult to work in time. In addition, the lack of financial freedomaffects the performance of thePSC.The PSC needs prior approval from the MOFfor any expenditure that curbs the independence of this constitutional body. He has the opinion that it is essential to increase the amount of allocated budget of the PSCfor smooth and quick management of the BCS Examination. Besides, the PSC cannot allocate the allotted budget to payan honorarium to the question setters, script examiners and others concerned with the BCS Examination without prior approval of the MOPA.In addition, the honorarium for question setting, examination script evaluation, and attending oral examination is low compared to the current market situation. The independence of the PSC, as stipulated by the Constitution, might be put into practice by granting it the freedom to manage its own budget.

Furthermore, the status, salary and allowances of the Chairman and Members of the Commission are not equivalent to other constitutional bodies in Bangladesh. This arrangement has an effect in undermining its position as an independent constitutional body, thereby affecting the discharge of its constitutional responsibilities regarding civil service recruitment and management. The rank number listed in the Warrant of Precedence for the Chairman and Members of the PSC often serves as a measure of their standing concerning other civil servants working for the government of Bangladesh. On September 24, 2012, the government amended Section 3 of the Members of the Bangladesh PSC (Terms and Conditions of Service) Act, 1974, and substituted Section 3A resulting in an increased salary, benefits, and status of the Chairman and Members (PSC, 2022, p. 3). The Chairman of the PSC is ranked alongside a government secretary under the current Warrant of Precedence (i.e. number 16), but it ranks the cabinet secretary as number 12 thus giving a distinct impression as to who is more important and consequently who has more status. The Chief Election Commissioner, a constitutional position ranks number 8 and Election Commissioners rank number 9 (Government of Bangladesh, 1986/2020, pp. 1-2).

The additional secretaries to the government are given the rank number 19, whereas the members of the PSCare given the rank number 20, which is

one rank below them (Government of Bangladesh, 1986/2020, p. 3). In contrast, the Chairman of the UnitedPSC in India ranks at a higher position (rank 9A) than the cabinet secretary (rank number 11) and the Members of the UnitedPSCand additional secretaries have been given the rank number 25 (Habibullah, 2021). In Pakistan, the Chairman of the FederalPSC ranks 10 and federal secretaries 15 while Members ofthe Federal PSC ranked 23 and additional secretaries to the Federal Governmentrank 21 (Maidh, 2012). It needs to revise the status of the Chair and Members of the Commission in Bangladesh considering the SAARC countries.

Every year hundred-thousands of candidates apply for the BCS Examination. For instance, the PSC received 3,46,992 applications in the 45th BCS Examinationfor 2,309 posts (PSC, 2022. P. 9). As the current premise cannot accommodate the huge number of candidates,the BCSExaminationis conducted at different centres across the country. So, there is a chance of mismanagement, question leakages and unfair practices in the examination. It is reported that nine candidates were accused of performing undisciplined activities in the preliminary test of the 45th BCS Examination and the PSC has cancelled their examination. To avoid such a situation modern well-equipped examination centres with more capacity at the PSC building in Dhaka and regional offices are necessary.Moreover,the PSC lacks human personnel, especially in the IT section (PSC, 2022, p. 27). To pace with the modern-daychallengesPSC needs to enrich the IT section. The PSC has already submitted to the MOPA for approval of establishing two different IT sections, recruiting personnel, purchasing computers and relevant materials as well as infrastructure development (PSC, 2022, p. 27) and awaiting approval from the MOPA.

Allegations of the leakage of BCS Exam questions have become a common occurrence during the 1990s and 2000s. Due to the preceding preliminary test's question paper being leaked, the preliminary test for the 24th BCS Examination was conducted twice (Karim, 2007, p. 18; Jahan &Shahan, 2008, p. 314). Once more, the Commission was shaken by a serious accusation that the 25th and 27th BCS Examination question papers had been leaked (Jahan &Shahan, 2008, p. 314). The PSC cancelled the written test of the 33rd BCS Exam as questionshad been leaked and were available in exchange for money (“PSC seeks BCS question leak info”, 2012). Recently, the Criminal Investigation Department of Bangladesh Police arrested a gang of people involved with BCS Examination question paper leakage and found five of their candidates passed the 38th BCS preliminary examination and sat in the written test. Besides, three of them were recommended for the 36th BCS Examination (Ara, 2023, p. 694). Besides, it was found that some candidates added another extra page to the original examination script in the examination hall. Bangladesh PSC Act 2023 was passed on 23 January 2023keeping a provision of a maximum of 10 years in jail and compensation for question leakage and two years in jail

with a fine for appearing at any recruitment test with a fake identity or any malpractice (Government of Bangladesh, 2023, p. 1261). Accordingly, the PSC has cancelled the preliminary examination of 9 candidates for their involvement in undisciplined activities in the preliminary test of the 45th BCS examination-2022 ("45th BCS Prelims", 2023).

Previously BCS Exam questions were printed in the Bangladesh Government Press. So, there was a chance of question leakage. The PSCnow printsthe questionsintheir ownpremise in Dhaka (PSC, 2022, p. 3) thus preventing the chances of question paper leakage. Additionally, a database of the candidates with their background information, an attendance sheet with colour photographs of the applicants and information onthe exam venue and sit distribution have been introduced to counter fake examinees. Furthermore, multiple sets of question papers for the preliminary and written test are prepared. The Commission selects the final question for the examination30 minutesbefore the scheduled time by lottery and informs the relevant persons by text message (PSC, 2022, p. 6). In this way,the Commission is trying to reduce the risk of question paper leakages.

There are debates and discussions on the standard of the BCS Examination question. The questions in the preliminary, written and even viva voce have been designed in such a manner that they cannot assess a candidate's managerial abilities or ability to take lessons from experience or other countries' examples and apply them to current work, nor can it assess their creative thinking and analytical skills. Most applicants memorize study materials, type their answers mechanically, and pass the test. While the BCS Examination targets to recruit meritorious applicants, many average students are being recruited by memorizing the guides. There has been a demand for changing the format of questions of the BCS Examinationfor a long time from various quarters. The questions experts have the opinion of developing a modern technique to set the questions as well as a question bank (Manzur, 2023). Considering the current global challenges the question pattern needs to be revised so that only guidebook and coaching-dependent candidates find it difficult to succeed. Recently, the Commission has decided to develop a question bank to expedite the recruitment process and standard of the questions with the assistance of specialists (PSC, 2022. p. 9). However, the Commission is not yet sure how long it would take to develop a question bank.

The PSC cannot arrange the huge examination with their own personnel. Like other countries,the PSC also seeks assistance from subject-related specialists. The PSC has developed a guideline to select the question setters, moderators, script evaluators and examiners for the *viva voce*from among theserving and retired civil servants, academics, prominent journalists and civil society representatives. The PSC claims to not interfere in the activities of exam-related persons. Additionally, the PSC arranges seminars, workshops and discussions with relevant specialists before question paper

setting and moderation (PSC, 2022, p. 9). However, the questions of the latest BCS Examinations (45th BCS Exam) show that no significant changes have been made in the questions.

Another significant problem to address is complaints about the oral evaluation because no precise manual or guideline is followed for the viva voce. There were allegations of being partial in the *viva voce* to candidates with political or other recommendations while being rude and making the candidates fail withthe opposite political philosophy. Additionally, it is a widely held belief that roll numbers of specific candidatesare given to the chairman and members during viva voce(Ara, 2023, p. 696).The interview revealed that four candidates with a high score in the written examination were declared ineligible after facing the *viva voce* twice as they have studied in the Madrasas. Additionally, viva boards are made up of a range of interviewers who typically assign quite diverse marks. To address the issue, the PSC formed the Board of Oral Examinations following the BCS Examination Rules 2014, with the Chair/Member of the Commission serving as the Board's Chair, officers with the rank of joint secretary or higher nominated by the government as Board members, and thematic experts serving as the Board member nominated by PSC(Ara, 2023, p. 693). Relevant documents and papers in a sealed envelope are forwarded to the concerned viva voce before 20-25 minutes of the board to ensure impartiality and accountability. It makes certain that no member of the PSChas access to information regarding which board s/he represents and which candidates and specialists will be on the board. Furthermore, no members of the board can use the telephone or cell phone during the interview sessions. Candidates are also not allowed to enter the board with any mobile device (PSC, 2022, p. 9). In this way,the PSC is trying to make the *viva voce* impartial.

The 41st, 43rd, 44th, and 45th BCS Examinations are all being handled concurrently by the PSC. Because each exam is at a different stage of its cycle, many candidates are forced to take all four at once. It is believed that the hiring process will be finished in a year, from the job advertisement to the chosen candidate, however, this is not the case in Bangladesh.On the contrary, the duration of the recruitment process by the commissions in Afghanistan and the Maldives ranges from one to two months on average, Bhutan's commission completes the process in about six months, and the commission in India completes the process in between six and nine months through examination and interview, and the duration in Pakistan is typically between eight and 10 months (SAARC, 2014, p. 115). The uncertainty brought on by the overlapped exams affects not only certain applicants but also the entire hiring process. The possibility of abnormalities and process compromises increases as the backlog continues to grow. The BCS Examinations, which are an essential tool for recognizing brilliant people and placing them in important administrative posts, have wider

ramifications for the country.There is a shortage of skilled government officials because a backlog delays the entry of deserving individuals. The PSC is working to create a schedule that will enable the BCS Examination to be finished in a year. The PSC has not yet completed that blueprint, though. Any such strategy cannot be carried out unless the backlog is first cleared. This necessitates taking immediate action to eliminate current bottlenecks, especially those caused by a lack of people, as well as reforming the examination and result management procedures through better planning and increased use of technology (Ahmed, 2021).

Since BCS jobs became popular among the youth, many coaching centres focused on BCS Examination are working. One coaching centre comes out with various amazing offers to outdo the other and attract job aspirants. It has been alleged that some coaching centres are using PSC-centric examiners as part of this offer. It is learned that coaching centres are using PSC examiners as the instructors. They are taking classes in different coaching centres. They even conduct mock *viva voce*.Some of these people are involved in various activities of the PSC from preparing BCS questions or viewing portfolios or viva boards. The PSC has been informed about them. However, no direct decision has been taken against them by the Commission (Hossain, 2023).

The PSC does not disclose the individuals' marks. Individual candidatescan apply to the Commission to get their marks in the written examination by paying fees since the 38th BCS Examination (PSC, 2022, p. 23). The examinees should be required to get the mark sheets of the successful candidates as soon as the results are announced. Additionally, the result sheets for every examinee (successful and failed) must be posted online. To re-establish confidence, it is also necessary to promptly lift any restrictions that now exist against contesting exam results.

The recruitment process could be made more manageable by taking steps to incorporate efficiency advantages at each stage. For instance, the government could establish that only individuals with first- and second-class bachelor's or master's degrees would be allowed to appear for the exam to minimize the number of applicants. The number of interviewees may then be limited to a maximum of three the number of candidates to be hired, and interviews could only be allowed to, say, the top 10% of the successful candidates. It may be possible to speed up exam completion by reducing the gap between the preliminary and major written exams, publishing exam results quickly, upgrading test locations and logistics, and increasing payment for those who evaluate the scripts. Similar to Afghanistan, Bhutan, India, and Sri Lanka, where the academic record of candidates is also taken into consideration in addition to written tests to select candidates, the previous educational achievements of the candidates may be considered (SAARC, 2014, p. 106).

In Bangladesh, there is no quasi-judicial function, whereas, in India, Pakistan and other SAARC countries except Nepal, this responsibility for resolving the candidates' complaints has been given to the Commissions. The Civil Service as a whole grants candidates the opportunity to appeal any Commission decision (SAARC, 2014, p. 7). Thus, the PSC is not accountable to the candidates for any misdeeds in Bangladesh till now. The government needs to develop a system to make the Commission accountable for its actions to the candidates. The Commission is required to provide the President with an annual report, which could serve as a means of holding the institution accountable. The PSC informs the government of its actions, any difficulties it has encountered in carrying out its responsibilities, and any recommendations it has for improving the institution's performance. The Commission's accountability to the public, however, has been unclear.It has been a little challenging for citizens to access PSC-related information.

One of the essential conditions for ensuring the Commission functions properly is guaranteeing its independence, with its members and chair being non-partisan individuals of high standing. However, since independence in 1971, the desire of governments to exercise control over the Members and Chairs of the PSC is evident. Successive governments in Bangladesh have tried to appoint the Chair and Members who believe in their political ideology. In 1972, at least three Members of the PSC (Second) allegedly were selected on political considerations. A new PSC Chair was chosen in 1977 based on his claimed close ties with the President (Ahmed, 1990: 126-129; Institute of Governance Studies, 2007, pp. 13-14). After 15 years of military rule, democracywas restored in Bangladesh in 1990. This time, the then ruling party Bangladesh Nationalist Party (BNP) appointed two professors who held strategic positions onthe white panel of Dhaka University Teachers' Association in the PSC as Chair and Member. The parties who came into power afterwards continued the same practice in appointing the Chair and Members. This trend is still going on. Very recently Bangladesh has witnessed a Member of the PSChas been made a member of the Bangladesh Awami League's international affairs sub-committee.According to experts, a person holding a constitutional position cannot hold such a political post and serve the purpose of a political party. However, due to country-wide debate and discussion, the controversial inclusion of that Member has been withdrawn from the Awami League committee (Staff Correspondent, 2023).Political leaders need to recognize the value of a skilled cadre service and stay away from the recruitment process.

Conclusion

Governance is centred on human capital, and the PSC is tasked with providing high-calibre human resources. The blame for Bangladesh's abysmal position in many global governance indexes is almost always

placed on the civil servants and the PSC has the legal authority to transform the bureaucracy on a fundamental level by recruiting brilliant officials in the service. Unfortunately, this constitutional body has failed to perform its functions efficiently. Debates and controversy surrounding the performance of this organization have been strongly influenced by the existing gaps and limitations of the constitutional and legal mandates and practices of the operations of the Commission. The Commission has been heavily utilized by the ruling parties since 1972 as a practical tool to further their interests.The ministers and MPs are among the high-ups who have lobbied the constitutional body to confirm the employment of their candidates.

The Commission's credibility is now in jeopardy in a significant way. One key hindrance to the PSC's ability to function is a lack of independence and authority. The PSC's authority is restricted to offering advice and recommendations on hiring, promotions, employee appeals, and disciplinary concerns of the public service in Bangladesh. The Commission lacks any executive authority to make any decisions. The PSC should have complete discretion over its executive actions. This is now the time to review, rethink, and discuss with all stakeholders, reimagine and redefine the role of the Commission, keeping its strengths and removing anything that, in the current environment, hinders effective governance and prevents the Commission from escaping its colonial inheritance. Thusit will be possible to transform the PSC into a credible, independent, effective, transparent, and accountable constitutional authority.

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Regional Health Infrastructure in North Bengal at the Time of COVID19 Pandemic

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Abstract

The current outbreak of COVID 19 has a profound impact on the regional health infrastructure of West Bengal. The present study scrutinizes the level of health infrastructure across the different regions of West Bengal. The existing evidence on health infrastructure clearly shows the wide disparity within the regions of West Bengal. It is found from the study that the backward regions have limited availability of health manpower, equipment, masks, sanitizer, Personal Protection Equipment (PPE) kit and insufficient health infrastructure during the pandemic. The test per million populations was quite low in North Bengal Region. The growth of COVID-19 cases and development the regional health infrastructure in West Bengal with reference to North Bengal has been analysed. The testing facilities and their expansion during lockdowns have been critically looked and found that the private laboratories are confined to urban centres only. The existing health infrastructure at district level and its preparation to combat COVID-19 is also captured systematically. The government of West Bengal hires the services of private health care hospitals throughout the state acknowledges the fact of deficient health care in the state.

Key words: COVID-19, Health Infrastructure, Governance, North Bengal.

Introduction

The healthcare services and their delivery vary across the different districts of West Bengal. It is evident from the study of Purohit (2008) that the efficiency of public health delivery system of West Bengal remains low and substantial disparities exist across the different districts in terms of per capita availability of hospitals, beds and manpower resources. The other dimensions are such as inadequate and inefficient budget allocation for

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health, the rural-urban disparity in spending of medical healthcare services (Choudhury, 2006). Majority of the people in rural areas go the public hospitals in accessing health care services but government health infrastructure presents a sick image (Soman, 2002). The five districts of West Bengal such as, Uttar Dinajpur, Maldah, KochBihar, Murshidabad and South 24 Parganas are characterised as high priority districts with majority of tribal population whose composite health index is below 50 per cent (Government of India, 2015). These districts are considered as backward region due to the insufficient socio-economic outcomes and lack of infrastructure facility and its unique geography (De, 1990). The economically backwards region are mainly situated in six northern districts of Darjeeling, Jalpaiguri, Koch Behar, Malda, Utttar Dinajpur and Dakshin Dinajpur, three western districts of Purulia, Bankura, Birbhum and Sundarban areas of North and South Twenty-Four Pargana district (Government of West Bengal, 2004). The major constraints in the development of these districts are due to historical reason, distance and locational consideration and social composition. The key health statistic has significantly improved in West Bengal as well as in the districts of West Bengal but the disparity within the districts is not wipe out (Government of West Bengal, 2016).

In this context, Regional Development (RD) should be viewed as the articulation of qualitative changes in the geo-bio-techno-social complex of interdependent phenomena in such a manner that the quality of human life improves within the framework of the integrity of the ecosystem (Raza, 1988). The RD refers to change in regional productivity as measured by population, employment, income and laboring conditions. It also means social development which includes quality of public health and welfare, environmental quality and creativity. The RD does not mean the exploitation of virgin territory or the domination of one culture over other but, instead, improving the conditions of chronically underdeveloped regions or regions undergoing cyclical change (Nelson, cf. Bingham & Mier, 1993).

The inter-regional disparity in health outcomes, infrastructure is very prominent between the districts, regions and socio-economic groups of West Bengal. The health care system in North Bengal provides an interesting case study for conceptualising the development dynamics of the region and its various dimensions of health care services. The structural and economic issues of North Bengal are a little different from the rest of the Bengal, and it contains several characteristics of deprivation such as occupational differentiation, the urbanisation process, education, social services, health facilities, and the local labour market (Xaxa 1985). Health outcomes of North Bengal are far below the state average and national average, and in some cases, they are close to the national average (Government of West Bengal, 2016). In North Bengal, health care infrastructure has been

minimal, and a significant gap exists in the health care institutions (SCs, PHCs, and CHCs) as per the population norms. The population below the poverty line is more than 40 per cent in most of the districts in North Bengal (Government of India, 2008). The differences in health care availability are captured and explained by the level of development of North Bengal and other parts of Bengal.`

Under this circumstance, it is utmost important for the provincial and national governments to effectively utilize the existing resources of health infrastructure and plan strategies during global pandemic and lockdown. The Coronavirus pandemic begun its journey from Wuhan in China in December 2019 and travelling through Europe (Jan-Feb 2020) and West Asia (Mar 2020). Further, it has reached to the new world USA and India (Mar 2020). However, nationwide lockdown was obviously a bold step to prevent and safeguard the human health of its citizens. Moreover, India's health care systems are far behind from some of the developed countries like the United States of America, United Kingdom, Canada, Cuba, Germany and the Russian Federation, and developing country like Bangladesh and Sri Lanka (Hossain, 2018).

Objectives

The research paper tried to enquire the following objectives:

1. To explore and assess the impact of shortcoming of health infrastructure in North Bengal during Pandemic.
2. To examine and analyze the existing regional health infrastructure and its preparedness during Pandemic in North Bengal.

Data Base and Methods of Enquiry

All the five NSS regions of West Bengal are considered in the current study. The five regions are the Himalayan Region (Darjeeling, Jalpaiguri, and Cooch Behar), Eastern Plain Region (Uttar Dinajpur, Dakshin Dinajpur, Malda, Murshidabad, Birbhum, and Nadia), Southern Plains Region (North 24 Parganas, Kolkata, and South 24 Parganas), Central Plains Region (Bardhhaman, Hugli, Haora) and Western Plain Region (Bankura, Purulia, Paschim Medinipur, and Purba Medinipur). Each of the regions is taken as a unit of analysis. The present study for the analysis of inter-regional disparities of health infrastructure are based on primary as well as secondary data sources. The North Bengal region is selected for the primary survey as it constitutes a relatively backward region in terms of development initiatives, and the share of poor vulnerable SC, ST, and Muslim populations are quite high as compared to the rest of Bengal. Within North Bengal, the study emphases on one best performing and worst-performing district in terms of health outcomes i.e. Darjeeling and Uttar Dinajpur.

Secondary data for the availability of health infrastructure are collected from various sources such as Statistical Abstract of 2012 and 2015,

Government of West Bengal, West Bengal Human Development Report (HDR) 2004, Health on March 2012 and Health on March 2015-16 (Draft Copy) of Department of Health and Family Welfare (DOHFW), Government of West Bengal. The data regarding the availability of COVID19 health infrastructure and reported cases are collected from the Health Bulletin, DOHFW, Government of West Bengal. Moreover, the data vis-à-vis number of sample tested for COVID 19 and testing laboratories are computed from ICMR notification, Health Bulletin and population Census 2011

Results and Discussion

Regional Health Infrastructure in North Bengal

The regional health care is always a kind of neglected areas of Government of West Bengal since independence. It is evident from the study of Hati and Majumdar (2011) that the infrastructural facility of West Bengal is found to be insufficient to treat the majority of the patients due to high population pressure. This is also responsible for reducing healthcare efficiency and poor level of healthcare delivery to the population of West Bengal. The epicenter of regional health care in North Bengal and only referral hospital is the *North Bengal Medical College and Hospital* which was set up in 1968. Till recently, it is only Medical College catering health services in North Bengal and its catchment starting from Malda (300 kms) in the South, Cooch Behar (200 kms) in east of Assam, Darjeeling (80 kms) and Sikkim (120 kms) in North and adjoining Bihar and Nepal in West. However, four Medical Colleges have come up in recent past and these are situated at Malda (2011), Berhampore (2012), Raiganj (2018) and Cooch Behar (2018). It is well-known fact that all the northern districts of the State of West Bengal i.e. Cooch Behar, Jalpaiguri, Darjeeling, North and South Dinajpur, Malda, Murshidabad etc. is considered to be unskilled labour supply zone in most of the cities of India and the migrant labourers are engaged in various kinds of urban services typically known as *Unoranised Sector* in economic terms (Hannan, 2020: www.vikalp.ind.in).

Having this background in mind, let us look at the rural health infrastructure in North Bengal in relation to the whole state of West Bengal. Table-1 shows that average population served per rural health care institution are very high in North Bengal as compare to rest of Bengal. Although, the population density is low in the districts of North Bengal with 804 persons per sq.km as compare to 1029 persons per sq. km in West Bengal (Census, 2011). This table also indicates that there are insufficiencies of rural health infrastructure in North Bengal to treat majority of the rural patients in normal times.

Table-1: District/Region-wise Health Infrastructure (Institutions) in West Bengal. (As on 31.12.2016**)**

Regions	Number of Healthcare Institutions				Average Rural Population served per Healthcare Institutions			
	SC	PHC	BPHC	Rural Hospital	SC	PHC	BPHC	Rural Hospital
Himalayan Region	1173	90	8	30	5508	71789	807626	215367
Eastern Plains	2888	246	21	75	6931	81369	789033	266892
Southern Plains	1810	111	13	39	5719	93260	796293	265431
Central Plains	1885	210	16	52	5202	46694	612862	188573
Western Plains	2613	257	18	77	5950	60497	863757	201917
North Bengal	2276	161	12	59	6148	86914	1166090	237171
West Bengal	10369	914	76	273	5997	68034	818199	227777
Mean	576.1	50.8	4.2	15.2	5987	73083	1070618	234524
SD	252.9	25	3.6	6.2	1664.3	30038.6	849650.3	93945.4
CV	43.9	49.3	86.1	40.7	27.8	41.1	79.4	40.1

Note: a) As per IPHS, one Sub-Centre established for every 5000 population in plain areas and for every 3000 population in hilly/tribal/desert areas whereas a Primary Health Centre (PHC) covers a population of 20,000 in hilly, tribal or difficult areas and 30,000 populations in plain areas and each CHC thus catering to approximately 80,000 populations in tribal/hilly areas and 1, 20,000 populations in plain areas.

Source: *Computed from Census of India (2011), Health on March 2015-16 (Draft Copy), Directorate of Health Services, Government of West Bengal*

Table-2 shows the availability of beds in Primary Health Centre (PHC), Block Primary Health Centre (BPHC) and Rural Hospital. Average population served per PHC, BPHC and rural hospital beds are quite high in North Bengal as compared to the state average and rest of the Bengal. As per the Bhore Committee (1946) recommendation, there should be at least one bed per thousand populations (Government of India, 1946). However, India still struggles to achieve this target for the rural areas. Average population served per BHC beds in North Bengal is about 87457 persons in comparison to 51604 persons in West Bengal. The corresponding figure for PHC and rural hospital beds in North Bengal are 11267 and 7307 persons in contrast to 8919 and 6643 persons in West Bengal. This reflects the unequal regional health infrastructure at the aggregate level. But if we compare and contrast across districts and regions picture gives an impression that Kolkata surrounding areas are better served than their distant areas.

Table-2: District/Region-wise Health Infrastructure (Institutional Beds) in West Bengal. (As on 31.12.2016)

Districts/ Regions	Number of Beds in Healthcare Institutions				Average Rural Population served per Healthcare Institutional beds (Calculated as per 2011, Census)			
	PHC	BPHC	Rural Hospital	Total Rural	PHC Beds	BPHC Beds	Rural Hospital Beds	Total Rural Beds
Himalayan Region	660	110	1010	1790	9789	58736	6397	3610
Eastern Plains	1988	360	2440	4788	10069	46027	8204	4181
Southern Plains	860	185	1310	2355	12037	55956	7902	4396
Central Plains	1571	270	1926	3767	6242	36318	5091	2603
Western Plains	1893	280	2665	4838	8213	55527	5834	3214
North Bengal	1242	160	1915	3327	11267	87457	7307	4206
West Bengal	6972	1205	9361	17538	8919	51604	6643	3546
Mean	387.3	66.9	519.5	974.3	9526.8	86854.1	7109.8	3740.1
CV	46.7	94.8	44.6	45.0	43.5	102.9	45.0	41.5

Source: *Computed from Census of India (2011), Health on March 2015-16 (Draft Copy), Directorate of Health Services, Government of West Bengal*

But all these facilities remain Kolkata-centric and this facility would have no meaning for rural mass and labour supply zones of the State if facilities are not decentralized and percolate down further. The MP of Darjeeling district pointed out in a local daily that there is a huge deficiency of manpower resources in North Bengal (Anonymous, 2021). This region required 574 surgeons, 7062 community medicine doctors, 1326 health workers in PHCs and 9171 health worker in SC. However, the state government unable to fill the vacancy of 503 surgeons, 1251 community medicine doctors, 576 health worker in PHCs and 7139 health worker in SCs of North Bengal (ibid.). Moreover, it is reported that 50 doctors of Raiganj Medical College and Hospital, Uttar Dinajpur were on leave and stayed in Kolkata till 24.03.2020. They were brought back from Kolkata with the intervention Mr. Arvind Mina, DM Uttar Dinajpur and to work in the Medical College (Uttar Banga Sambad: 25.03.2020). The same situation is found in North Bengal Medical College and Hospital, Darjeeling and reported that most of senior resident doctors, Assistant Professors and Associate Professors were on leave and stuck at Kolkata due to sudden lockdown (Uttar Banga Sambad: 25.03.2020). It is also evident that all the newly established regional medical colleges in the State, senior experienced doctors work only for three days and rest of the days in a week, they remain in Kolkata. This not only hamper regular treatment but lack of advisory and consulting facilities for the upgradation of regional health care and

peripheral regions in the State suffer from proper guidance and planning. The North Bengal region is one of such example.

COVID-19 Pandemic and Preparedness of Health Infrastructure

The COVID-19 has spread in all the districts of West Bengal and daily more than 1000 new cases reported in the state. The rate of increase of COVID-19 creates an alarming situation in the urban part compared to the rural part. The West Bengal has the seventh most number of reporting cases (30013 cases) and the fifth number of reporting deaths (932 deaths) among the other Indian states (as on 12/07/2020). In May, the death reported in West Bengal as per the death audit committee had triggered a great deal of political controversy in suppressing the number of deaths. While the state health department had claimed that the death reported in COVID-19 cases follows the protocol set by the Indian Council of Medical Research (ICMR).If we tracking the testing pattern of West Bengal then the number of samples tested are only 519 at the end of March to 16525 till 30th April. In the month of May to June, West Bengal ramp up the testing to around 9, 000-10,000 testing per day after the interference of the High Court. The Hon'ble High Court of Calcutta had admitted bunch of writ petitions questioning the state's handling of the pandemic on April 17, 2020 and asked the state government to report its "adherence to effective screening on war-footing" and "acceleration of the rate of sample collection and testing" (Bose, 2020). The factual data of COVID-19 testing was available at aggregate level and the regional and district-level picture was not available in public domain. In response to a clutch PILs on issues of more testing, protection to the medical professionals and audit committee reports on COVID deaths, High court of Kolkata tells the state to look into the requirement of more testing on war footing by following the guidelines of WHO and ICMR (Singh, 2020).

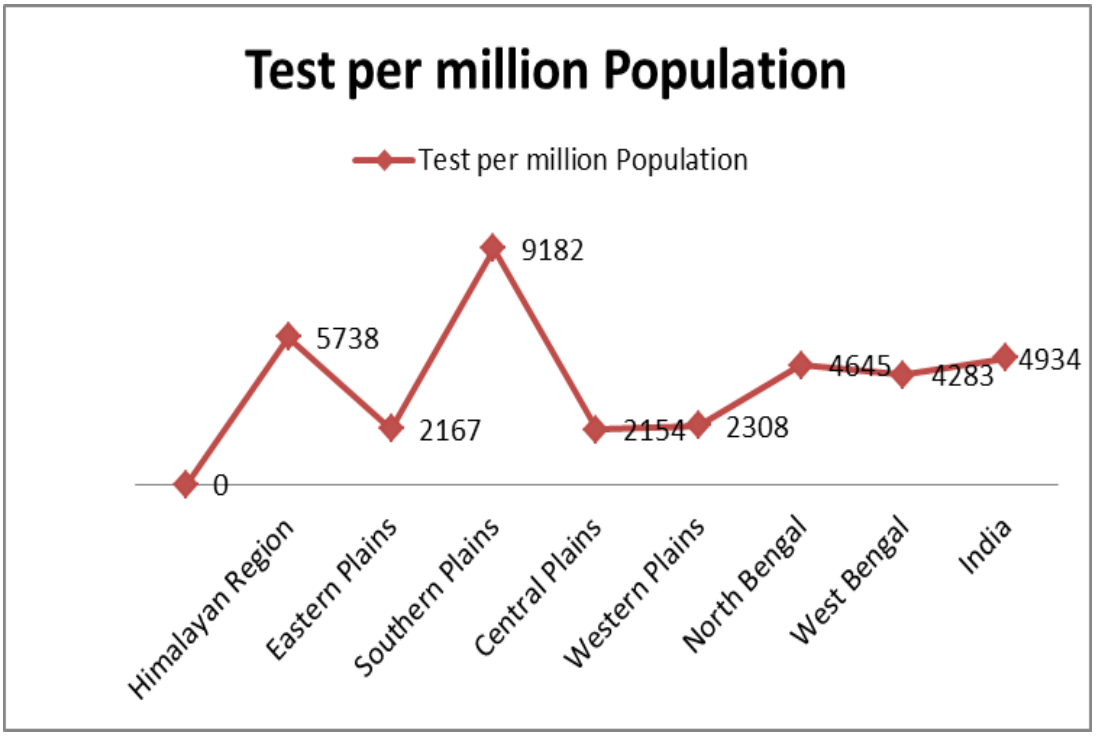
Table 3: Region-specific COVID-19 Testing Laboratories and Sample Tested

	ICMR lab as on 20/06/20				**Sample tested as on 20/06/20**	**Test per million Population**
Regions	**Govt**	**Private**	**Total**	**Lab Per Million population**		
Himalayan Region	5	1	6	0.7	48999	5738
Eastern Plains	9	0	9	0.4	52976	2167
Southern Plains	13	13	26	1.1	208152	9182
Central Plains	3	1	4	0.2	38950	2154
Western Plains	5	0	5	0.3	40470	2308
North Bengal	7	0	7	0.4	79953	4645
West Bengal	35	15	50	0.5	390942	4283
India	722	259	981	0.8	6807226	4934

Source: *Computed from ICMR notification dated 20/06/20, Health Bulletin20/06/20 and population Census 2011*

Among the other region of West Bengal, the test per million populations is highest with 9182 in Southern Plain Region and mainly concentrated on Kolkata only (see Table 3). The test per million populations was quite low in Eastern Plain and Central Plain Region (see Figure 1). ICMR lab for both government and private is mainly located in Kolkata. All the 12 private labs are located in Kolkata and one each in Siliguri, Durgapur and Diamond Harbour. The Anandaloke Sonoscan Centre in Siliguri not functional till date (June, 2020). In September, North Bengal experiences an increase of about 100-150 positive cases per day and it was a major setback in the delivery of health care services in North Bengal. In nutshell, the testing infrastructure is not satisfactory in North Bengal and periphery remains neglected by the state. This testing infrastructure also gives an impression of low priority of peripheral districts in governing health in West Bengal.

Figure 1: Region-wise Test per Million Populations in West Bengal



Source: *Computed from Table 3*

Table 4: Region-specific COVID-19 Health Infrastructure and Reported Cases

Regions	COVID-19 infrastructure As on 20/06/20						COVID-19 Cases (as on 20/06/20)		
	Public (Government designated COVID hospital)			**Private Hospital**					
	Hospital	Beds	Beds vacant	Hospital	Beds	Beds vacant	Cases	Recovery	Mortality
Himalayan Region	10	1095	794 (72.5)	0	0	0	1040	611	6

Eastern Plains	18	1601	1435 (89.6)	0	0	0	1430	994	10
Southern Plains	20	3815	2595 (68.0)	25	812	264 (32.5)	7045	3494	424
Central Plains	18	2725	2359 (86.6)	0	0	0	3077	2088	91
Western Plains	11	1104	1002 (90.8)	0	0	0	873	633	6
North Bengal	16	1376	1030 (74.9)	0	0	0	1744	1104	6
Rest of Bengal	61	8964	7155 (79.8)	25	812	264 (32.5)	11721	6716	531
West Bengal	77	10340	8185 (79.2)	25	812	264 (32.5)	13531	7865	540

Note: COVID-19 beds including the isolation beds, in bracket showing the percentage of beds vacant,

Source: *Computed from Health Bulletin on 20/06/20, MOHFW, GoWB*

The current outbreak of COVID 19 has a profound impact on the existing health infrastructure of West Bengal. If we analyse spatially, the COVID-19 infrastructure in West Bengal then the Southern Plain Region has the highest number of both public and private hospitals with the maximum number of beds (see Table 4). Among the all-region of West Bengal, Himalayan Region and Western Plain Region has the lowest number of Government designated COVID-19 hospitals. All the private COVID-19 hospital is situated in Kolkata and North 24 Paragana district. Table-3 clearly shows that about 74.9 per cent of beds are vacant in North Bengal as compared to the state average of 79.3 per cent. In the Southern Plain Region, 32.5 per cent of beds are vacant in private hospital. But recently, peoples in Southern *Plain Region* suffer a lot to get a bed in private hospital. However, it is found from the telephonic survey that some of the people are getting beds by paying the amount of 1.5 to 2 lakhs through the backdoor route.

Governing Health and Outcomes in North Bengal

The state of West Bengal is unique in the country where left government ruled for more than a quarter of a century. The two major public initiatives had implemented by West Bengal Government in 1977 was land reforms and decentralisation which impacted positively in reducing poverty, and in the process of growth and development of the State. However, it is evident from various literature (Raychoudhuri and Haldar 2009 and Purohit 2008) and government reports (Government of West Bengal, 2004; Government of India, 2002) that the inter-district and intra-regional differences in the state are widening. The six northern districts are considered as backward region due to the insufficient socio-economic outcomes and lack of infrastructure facility.

To improve the health of the population, state government has introduced "Swasthya Sathi" scheme in the year 2016. The main feature of the Swasthya Sathi scheme is to cover basic health cover for secondary and tertiary care up to Rs. 5 lack per annum per family. Swastha Sathi covers up to 1.5 lakh through insurance mode and beyond 1.5 lakh to 5 lakh through assurance mode. All the pre-existing disease is covered in this scheme with irrespective of family size. All the district of West Bengal covers about 64 lakh families for secondary and tertiary care up to Rs.1.5 per annum per family. Critical illness like Cancer, Neuro surgeries, cardiothoracic surgeries, liver diseases, blood disorders etc., will be covered up to Rs 5 Lakh per annum per family, and the cost thereof will be borne by the State Government. About 7 crores 50 lakhs family included in the Swastha Sathi scheme till 30 April 2020 with 1570 empanelled hospitals and 1092825 persons befitted from the scheme (Government of West Bengal, 2020). The beneficiaries of this scheme avail the services from paperless, cashless smartcard valid for a lifetime with auto-renewed in each year (ibid). The token of the Swasthya Sathi card is distributed through the self-help groups. It is reported in Uttarbanga Sambad (2019) that the distribution of the Swasthya Sathi token depends upon the political affiliation of the member of self-help groups. This politicisation in the distribution of the token of the Swasthya Sathi card was leading to the deprivation of other villagers in getting the token. But during the fieldwork in North Bengal, it is revealed by the beneficiaries that private hospitals refused to treat patients with this card. Till now, this card is not utilised extensively by the empanelled hospital, which includes private hospital also. Recently West Bengal government has also passed an order with regard to the refusal of treatment by the empanelled hospitals (Order dated 08.01.2020, Memo No. HF/O/SS/EC_MEETING/2016/Part 2A/1997).

Other than this the process of decentralisation is also very poor in the districts of North Bengal. The evolution report of the Department for International Development (DFID) of Strengthening Rural Decentralisation (SRD) programme identified that these priority districts requiring more focus intervention and need planning on poverty. It is also found that the Fiduciary Risk Assessment (FRA) was also high in these districts. As per the Annual Administrative Report (2008-09), Panchayat and Rural Development Department, Government of West Bengal, most of the districts in North Bengal are the worst-performing districts in terms of service delivery by the panchayats of the respective districts. The literature on decentralisation of service delivery suggests that local-level democracy may not function well due to unequal distribution of assets, literacy, social status and political participation. The poverty alleviation effort of the West Bengal panchayats was not achieved successfully due to the phenomenon of limited accountability of gram panchayats in the presence of high inequality in socioeconomic status and political power (Bardhan and Mookerjee, 2003).

As per the NHM manual, there should be certain committees like Rogi Kalyan Samity (RKS) at the district and block level and people's organization such as Village Health Sanitation and Nutrition Committee (VHSNC) at gram panchayat level. These committees are needed for decentralized outcome-based planning and implementation. But these types of committees are not functioning properly as per the NHM guidelines. The Rogi Kalyan Samity or patient welfare committee is an effective management structure for proper functioning and management of the hospital. The main objective of the RKS is to ensure proper accountability of public health providers to the society, proper availability of essential drugs, proper scientific disposal of hospital waste, provide drinking water subsidized food, medicine and cleanliness, introduce transparency in the management of funds, supervise the implementation of National Health Programmes, display of citizen charter, upgrade and modernize health service facility and undertake construction and expansion of building as per the hospital need (Government of West Bengal, 2010).

It is evident from the field work in North Bengal that RKS is ineffective to address the various objectives at the block level. The Rogi Kalyan Samity is functioning at the district level only. It is found from the fieldwork in the districts of Darjeeling and Uttar Dinajpur that the meetings were not conducted regularly at the block level. There are absences of activities between the Village Health Sanitation and Nutrition Committee (VHSNC) and the Sub-Centre in the North Bengal region. There was no such local-level community action under VHSNC on the issues related to health and its social determinants at the village level. Community-level services in the process of decentralized planning are not initiated by the VHSNC in the villages of Chakulia block in the district of Uttar Dinajpur. During the field visit, it was found that all the interacted ANM and ASHA workers were not aware of the constitution of Village Health Sanitation & Nutrition Committee and it's functioning. ASHA workers were unaware about their membership in the VHSNCs. The ANM and ASHA workers are not aware of the role of VHSNC and refer it as a function of Panchayat Samiti (Block Political Unit). However, the importance of VHSNC has been realized during COVID 19 Pandemic for controlling the spread of coronavirus in the villages.

Concluding Remarks

During pandemic, the improvement of health infrastructure and COVID-19 hospitals were developed in urban areas and metro cities of labour supplying states of Bihar, West Bengal, Odisha, UP etc. But now all these states should take sincere efforts and stimulate the chain of Rural Health Care Network of Sub-Centres, Primary Health Centres, Block Primary Health Centres and Rural Hospitals. The rural health care network is weak in labour supplying states and COVID-19 testing laboratories are situated in urban centres in these states. In West Bengal too, it is mostly Kolkata-centric.

During pandemic the alliance with private health facilities in West Bengal is attempted and this itself proves about weak health care system in the State.

However, the available evidences on decentralised institutions perceptibly show the poor performance of Panchyat Raj Institutions (PRI) in the backward regions of West Bengal. Within this backdrop, it is very important to promote the institutionalization of panchayat raj with functions like health, finance and functionaries. The Committees like Rogi Kalyan Samity (RKS) and Village Health Sanitation and Nutrition Committee (VHSNC) is the important instrument towards facilitation of inter-sectoral coordination, local community participation in decision making and improving facility-based health care services (Narwal 2015). But during pandemic, State government announces withdrawing of power from the *Rogi Kalyan Samities* and makes it more centralised to overcome the present crisis (ABP Ananda 2020). The centralized system of health administration is creating more problems to deal with the COVID-19 crisis in the rural populace of North Bengal. This pandemic requires more engagement of panchayats with the collaborative effort of self-help groups to set up quarantine facilities within the village premises and provide masks, sanitizer, food and safe drinking water to the vulnerable populace and migrant labourers. During this health crisis, Government should promote *Mobile Health Services* in the inaccessible terrain of North Bengal as well as on other backward regions which include the facility of doctor, lifesaving medicines and diagnostic testing kits.

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Comparative and States of Soil Health as Supported By Nature-Based Solutions under Organic and Conventional Tea Lands in Upper Highlands, Sri Lanka

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Abstract

Conventional approach of tea cultivation using agrochemicals is negatively affecting soil natural fertility. Excessive and unbalanced use of agro-chemicals has led to increased production costs but decline in farm productivity. Organic sources may reduce the dependency on chemical fertilizers. An organic system uses compost, animal manure, green manuring, biofertilizer (liquid fertilizer), tree lopping, and leguminous plants. Organic tea fields use a mulching system using rice straw, weed barrier, and defoliate leaves. Also, use deep drains and rainwater harvesting systems to conserve soil moisture. The sustainable Agriculture network (SAN) promotes the social and environmental sustainability of agricultural activities. A certification body certifies farmers of group administrators that comply with SAN standards and policies. The present

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study was planned with an overall objective of comparing soil health including soil pH, soil moisture and soil microbial activity under organic, sustainable agriculture standards and conventional systems. The experiment was carried out at smallholder organic tea fields and conventional tea fields in the Upper highlands in Sri Lanka. Minimum and maximum temperatures are 18°C and 34°C respectively. Soil microbial activity is determined by analyzing the amount of CO2 released using Anderson method. Also soil pH was measured using pH meter. The data of biological and chemical parameters of tea soils exposed to organic and conventional practices of tea were analyzed by SAS package. A questionnaire was given to tea farmers in order to gain information on cost for tea cultivation, income status, yield, problems and social satisfaction. The presence and action of all fauna and flora in soils is exhibited as biological activity. Organic tea soil has a significant difference with Natural forests, Pinus, Eucalyptus and vegetable soils. The reason for the lower value of soil biological activity may be due to the reduction of soil organisms as a result of excessive fertilizer applications in conventional fields. Soil moisture retention capacity is influenced by texture, structure, organic matter and soil depth. According to Duncan's Multiple Range Test soil moisture of organic and conventional has a significant difference. Conventional practices in tea cause the lower soil moisture of organic practices and enhance that by ensuring soil health. Organic tea fields use a mulching system using rice straw, weed barrier and defoliate leaves. Also use deep drains and rain water harvesting systems to conserve soil moisture. Both the organic and conventional tea soils are within recommended pH range for tea growth (4.5-5.5). However, long term exposure to organic tea cultivation will result in increased pH which is considered a limitation. The organic lands in Upper highlands are yet in the preliminary stage and would later experience high pH levels. There is an enhancement of biological and chemical properties in organically maintained soils in upper highlands compared to those under conventional practices. Organic soils are in a good range caused by good biological, chemical, cultural, and traditional methods. Organic farmers use environmentally friendly manures and fertilizers to improve their yield.

Keywords: Conventional tea, Organic tea, Soil microbial activity, Soil moisture, Soil pH

Introduction

Tea plays a major role in the Sri Lankan economy since James Taylor undertook the first commercial planting of tea in Sri Lanka in 1867. Tea (Camellia sinensis) is growing as a tree in many parts of the world with a wide adaptability. The Sri Lankan economy is largely sustained by the ten industries due to provision of employment directly or indirectly to over one million people. The total area planted with tea in Sri Lanka is about 188,175 ha and total production is 300 kg million per year (Sri Lanka tea board, 2022). Organic tea cultivation was undertaken in Sri Lanka 1983 and in the

year 2000 about 336 MT of organic tea were produced in the country (Mohotti, 2002). At present Sri Lanka caters to many strong international markets with organic tea. Organic teas fetch 3-4 fold prices of conventional teas. In this respect it can be regarded as working more deeply with nature. It attempts to strengthen the support we get from the cosmos, firstly by the use of special preparations, and secondly by the use of a calendar which enables us to manage each particular crop under the most beneficial influences (Smith, 2007). The sustainable Agriculture network (SAN) promotes the social and environmental sustainability of agricultural activities. A certification body certifies farmers of SAN group administrators that comply with SAN standards and policies. Farmers can apply for use of the "Rainforest Alliance Certification (RAC)" certified trademark for products grown on SAN farms in Sri Lanka. The mission of SAN is to "Promote efficient agriculture, biodiversity conservation and sustainable community development"(SAN, 2010). Sri Lankan researchers have been studying the soil health of organic and conventional tea fields in Upper highlands, Sri Lanka. The aim of the study was to compare soil health including soil pH, soil moisture and soil microbial activity under organic, sustainable agriculture standards and those using agrochemicals.

Main Objectives

1. To study environmentally, economically and social sustainability of organic and conventional tea farming.
2. Examine the soil characteristics in organic and conventional tea farming practices.
3. Compare the factors affecting soil health in organic and conventional tea farming.
4. Analyze the most compatible farming method to sustain the soil health.

Material and methods

Experimental site

The experiment was carried out at organic and conventional tea fields in Upper highlands, Sri lanka. Maps were studied using Google Earth to retrieve data covering the entire area. All together, 239 samples were collected from all four zones.

	Sample count					
Zone	Organic tea	Conventional tea	Natural forests	Eucalyptus plots	Pinus plots	Vegetable plots
Madhuwelpathana	56	10	03	03	03	03
Wegoda	38	20	03	03	03	03
Halpe	31	10	03	03	03	03
Heeloya	10	06	03	03	03	03

Table 1: Sample count of all four zones

Both laboratory and field experiments were carried out to fulfill the overall objectives of comparing soil pH, soil moisture and soil microbial activity of organic tea field, conventional tea fields, Pinus forests, Eucalyptus forests, natural forests and vegetable plots.

Soil sampling

Field soil samples were drawn randomly to a depth 0-15 cm from each organic and conventional tea lands. Samples from 04 places in each location were taken with an auger. Pooled together and well mixed, composite soil samples were kept under cool and humid conditions until used for the experiments. Soil samples from Pinus forests, Eucalyptus forests, natural forests and vegetable plots were also drawn in the same manner to be compared with organic and conventional tea soils for soil biological and chemical parameters. The analysis was done to determine the following biological and chemical parameters of tea soils exposed to organic and conventional practices in Upper highlands.

Determination of soil biological properties

Soil microbial activity measurement

Soil respiration of different treatment plots were determined by using the method described by Anderson (1982). A mass of 10g of soil for each treatment plot was placed in a reagent bottle, 3.5ml of distilled water was added and mixed well. An ignition tube containing 3ml of 0.5N NaOH was hung upright in each bottle and the reagent bottle was sealed tightly using para film. After two days the content of each ignition tube was washed into 200ml of beaker using distilled water. Then 7.5ml of 2N $BaCl_2$ and a few drops of phenolphthalein were added as an indicator. This was titrated against 0.5N HCl and the amount of CO_2 released during seal period was determined using following equation.

Amount of released $CO_2 = (3\text{-}V_1) \times 22 \times 0.001$mg / day / 10g of soil

Where V_1 (Volume of NaOH not neutralized by CO_2 released) = $(N_2 \times V_2)/N_1$

N_2 = Normality of HCl

N_1 = Normality of NaOH

V_2 = Volume of HCl

Soil moisture

Of all the gravimetric techniques for determining soil moisture, oven drying is perhaps the most popular and is frequently used to calibrate other soil moisture determinations. With this technique, a soil sample is over-dried at 105 °C until a constant weight is produced. Typically, this weight is produced in 24 hours, but larger samples require longer drying times. Before oven drying, the soil sample's wet weight (10g) is recorded. The sample's moisture content can be computed and reported as a percentage of the dry

soil weight, allowing the amount of water in the sample to be identified (Schmugge et al., 1980). The gravimetric value is multiplied by the bulk density of the soil if the volumetric water content is required:

$SM = (10g - W_d)/10g * 100\%$

Where,

SM = Soil moisture (%)

W_d = dry weight of soil (g)

Determination of soil chemical properties

Soil pH

A mass of 10g of fresh soil was weighted and placed in a 50ml pH cup. Then, a volume of 25ml of distilled water was added (soil 1: water 2.5), stirred well using a plastic rode. The suspension was left for 30 minutes. It was stirred well and the pH was measured using pH meter.

Data analysis

The data of biological and chemical parameters of tea soils exposed to organic and conventional practices of tea were analyzed by SAS package.

Results and Discussions

Soil Microbial activity

The presence and action of all fauna and flora in soils is exhibited as biological activity. Data generated in tea soils exposed to organic and conventional practices in Upper highlands and undisturbed natural forest soil, Pinus soil, Eucalyptus soil and vegetable soil are presented in figure 1.

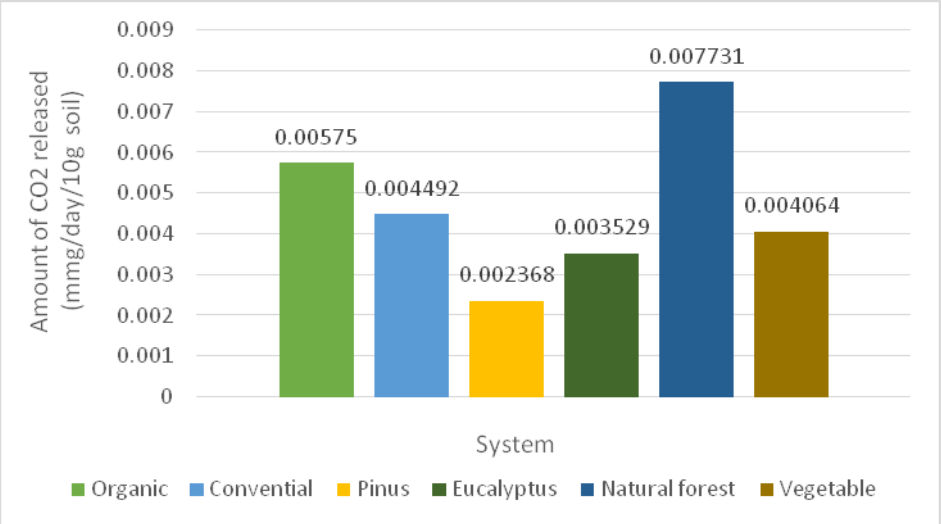

Figure 1: Biological activity of organic and conventional tea soils, undisturbed forest soil, Pinus, Eucalyptus, and vegetable soils

Data showed that both conventional and organic tea lands had statistically significant soil microbial activity ($P \leq 0.05$). According to Duncan's Multiple Range Test Microbial activity of organic and conventional has a significant

difference. Also Organic tea soil has a significant difference with Natural forests, Pinus, Eucalyptus and vegetable soils. Microbial activity of conventional tea soil has a significant difference with Natural forests and Pinus soils but conventional tea soil has no significant difference with Eucalyptus and vegetable soils. The highest biological activity was recorded in the forest sample (7.75µg/day/10g of soil) while it was more closely to that of organic tea soils (5.875µg/day/10g of soil).

The presence and action of all fauna and flora in soils is exhibited as biological activity. Organic tea soil has a significant difference with Natural forests, Pinus, Eucalyptus and vegetable soils. The reason for the lower value of soil biological activity may be due to the reduction of soil organisms as a result of excessive fertilizer applications.

Soil moisture

Soil moisture retention capacity is influenced by texture, structure, organic matter and soil depth. In general, greater the percentage of pore spaces in a soil of given texture, the greater will be the water retention capacity. Data generated in tea soils exposed to organic and conventional practices in Upper highlands and undisturbed natural forest soil, Pinus soil, Eucalyptus soil and vegetable soil are presented in figure 2.

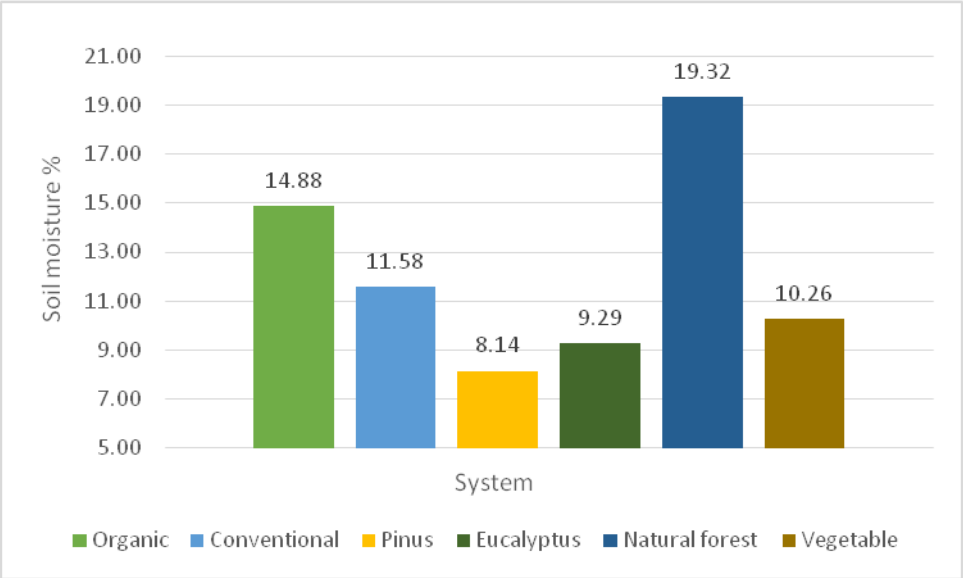

Figure 2: Soil moisture of organic and conventional tea soils, undisturbed forest soil, Pinus, Eucalyptus, and vegetable soils

Data showed that both conventional and organic tea lands had statistically significant soil moisture ($P \leq 0.05$). According to Duncan's Multiple Range Test soil moisture of organic and conventional has a significant difference. Also Organic tea soil and conventional tea soil have a significant difference with Natural forests, Pinus, Eucalyptus and vegetable soils. Organic tea soil is 22.17% more healthy than conventional tea soil in Upper highlands. Organic tea fields use a mulching system using rice straw, weed barrier and defoliate leaves. Also use deep drains and rain water harvesting systems to conserve soil moisture.

Soil pH

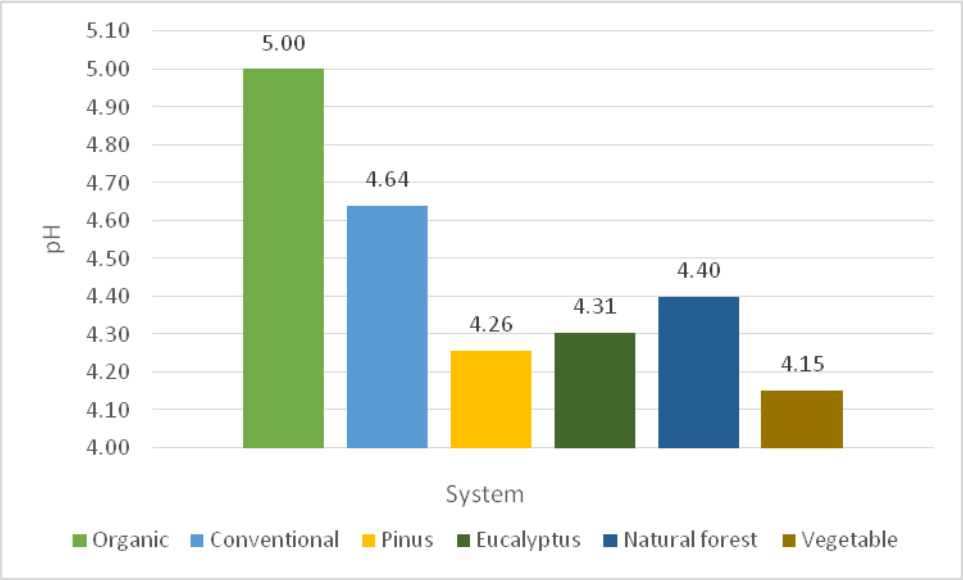

Figure 3: Soil pH of organic and conventional tea soils, undisturbed forest soil, Pinus, Eucalyptus, and vegetable soils

As shown in figure 3, Data showed that both conventional and organic tea lands had statistically significant difference in soil pH ($P \leq 0.05$). According to Duncan's Multiple Range Test soil pH of organic and conventional has a significant difference. Soil pH of Organic forests, Pinus, Eucalyptus and vegetable soils have no significant difference between each other. Long-term exposure to organic tea cultivation will result in increased pH which is considered a limitation. Organic lands in Upper highlands are yet in the preliminary stage and would later experience high pH levels.

Estimated yield

The estimated yield (Kg/Month/ha) of organic and conventional tea is presented in figure 4.

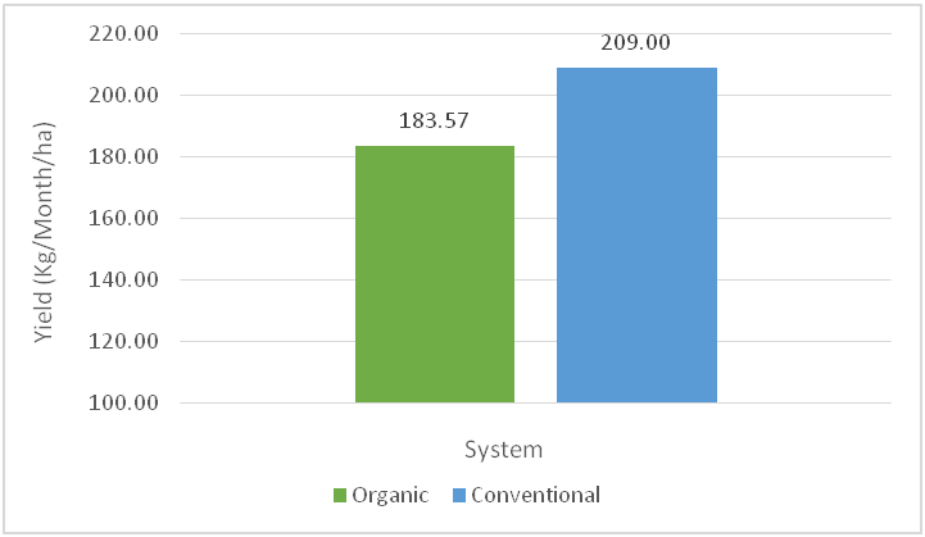

Figure 4: Estimated yield of organic and conventional tea lands (Kg/Month/ha)

Even though the majority of organic tea farmers had a negative opinion of the productivity of the organic system compared to conventional tea, the results of the socioeconomic survey did not show a statistically significant (P=0.2252) difference in yield (Kg/Month/ha), according to the findings shown in figure 4. Organic tea yield is 183.57Kg/Month/ha and conventional tea yield is 209.00 Kg/Month/ha. A Higher number of Conventional tea fields are located in Upper highlands than organic tea fields. But as shown in figure 4, the estimated yield of organic and conventional tea has not changed much because chemical fertilizers are prevented by the government and available fertilizer stocks are too expensive.

Conclusion

The present study was carried out in Upper highlands in Sri lanka, with an aim of conducting a comparative evaluation of organic and conventional tea systems to have a perception of evaluating soil biological and chemical properties and socio-economic status which represents the actual scenario of organic tea cultivation in the country in practice.

The overall results revealed that there is an enhancement of biological and chemical properties in organically maintained soils in Upper highlands which are statistically significant in situations under conventional practices. It can be concluded from the findings of the soil analysis that the soil biological parameters such as soil microbial activity and soil moisture water retention capacity are significantly higher in organically maintained tea soils than in conventional tea soils. Enhancement of biological properties of tea soil ensures the soil health together with chemical and physical properties which may affect the sustainable productivity. Both organic and conventional soils are in a good range caused by good biological, chemical, cultural, and traditional methods.

Based on the social survey, it can be concluded that the farmers perception on conventional tea yields have become lower because of a chemical fertilizer prohibition from the government. Therefore, available chemical fertilizers and manures are limited and more expensive. Therefore, farmers have restricted of using fertilizer due to the shortage. Organic farmers use eco-friendly manures like compost, chicken manure and bio fertilizers to improve their yield.

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ChatGPT Reshaping Social Sciences: A Paradigm Shift in Research, Education, and Ethical Frontiers

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Abstract

In the era of digital transformation, the accelerated dominance of Artificial Intelligence (AI) has propelled remarkable advancements across diverse fields. Recognized for its potential to significantly enhance productivity and efficiency by automating repetitive tasks and swiftly processing extensive datasets, AI, particularly through innovations in machine learning and natural language processing, has yielded substantial benefits in healthcare, finance, and transportation. This study systematically investigates the impact of ChatGPT on research communication within the realm of social sciences, analyzing 25 scholarly articles and curating ten based on relevance and depth of analysis. Focusing on the paradigm shift induced by ChatGPT, particularly in research and education, the discussion critically evaluates the ethical implications of its deployment in social sciences research, centering on aspects such as data privacy, prejudice, and responsible usage. Emphasizing the imperative need for comprehensive guidelines, the paper provides a nuanced examination of ChatGPT's diverse influence, offering insights into its functionalities, consequences, challenges, and future prospects, thereby contributing to a transformative discourse on the ethical frontiers of AI in social scientific research.

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Introduction

In the digital transformation era, artificial intelligence (AI) has ignited profound changes across many domains, reshaping our interactions, communications, and research practices (Enholm, 2022). During this era of rapid technological evolution, notable innovations pushing the boundaries of technology have emerged, and ChatGPT stands out as a significant achievement in the field of AI (Ray, 2023). Developed by OpenAI, ChatGPT harnesses the prowess of advanced language modelling to generate text akin to human expression and engage in conversations that align with context (Dwivedi, 2023). Beyond being a mere AI tool, ChatGPT is a transformative force with numerous implications (Peters, 2023). Amidst this innovation landscape, one arena experiencing a tectonic shift is the domain of social sciences. (Wang, 2023). With the capacity to unravel intricate concepts and partake in nuanced dialogues, ChatGPT has cemented its role as a revolutionary asset. Nowhere is its impact more palpable than in the social sciences, where exploring human behaviour, societies, and cultures intersects with cutting-edge technology. (Kulikov, 2021). This article embarks on a comprehensive exploration—an intricate study and analysis—of ChatGPT's profound influence on the social sciences. As researchers delve into the vast realm of social sciences, ChatGPT's advanced capabilities have enabled them to navigate complex theories and engage in interdisciplinary discussions. (Dwivedi, 2023). By seamlessly integrating with the field, ChatGPT has opened up new avenues for understanding societal dynamics and has become an indispensable tool for conducting empirical studies and generating insightful hypotheses. (Ray, 2023). Its transformative impact has accelerated research processes and fostered collaborations between social scientists and AI experts, leading to groundbreaking insights that shape our understanding of human behavior and societal structures. (Rasul, 2023) By delving into its implications, applications, and potential challenges, we unveil the transformative role of this AI marvel in reshaping social research, communication, and discourse. Through this inquiry, we illuminate how ChatGPT, within the realms of the digital age, is reshaping the very fabric of social sciences, introducing new dimensions for exploration and insight.

Unveiling ChatGPT: A Concise Overview

ChatGPT, a revolutionary stride in artificial intelligence, is constructed upon an intricate architecture that enables it to grasp and generate text resembling human expression. This architecture finds its roots in the transformer model, a neural network design adept at capturing the contextual interplay within data sequences (Vaswani, 2017). This structural foundation is pivotal in empowering ChatGPT's extraordinary ability to craft coherent and

contextually fitting text. At the heart of ChatGPT's capabilities lies its attention mechanism, an integral facet of the transformer architecture. This mechanism empowers the model to assign varying degrees of significance to individual words in a sentence, mimicking the allocation of human attention. By leveraging this mechanism, ChatGPT navigates the nuances of language and fabricates responses that seamlessly align with ongoing conversations. The transformer architecture equips ChatGPT with the process to comprehend distant dependencies within text, forging connections between words or phrases separated across sentences (Radford, 2019). This attribute substantially bolsters the fluency and coherence of ChatGPT's responses. The architecture's versatility is another remarkable trait, enabling ChatGPT to engage in various language-related tasks—from addressing factual queries and providing explanations to creative composition and crafting natural-sounding dialogues. This adaptability stems from the model's profound grasp of language patterns, facilitating the adaptation of responses to various prompts. (Vaswani, 2017; Kasneci, 2023).

Architectural Phases and Iterative Refinement: The Developmental Journey of ChatGPT

The developmental trajectory of ChatGPT is characterized by a sophisticated two-step process, as elucidated in Brown (2020), wherein a substantial amalgamation of datasets and human insights are instrumental. The inaugural phase, denominated the Pre-Training Phase, initiates the model's immersion in a diverse dataset encompassing a myriad of internet domains. This phase is distinctly dedicated to the anticipation of forthcoming words within sentences, thereby facilitating ChatGPT's acquisition of grammatical intricacies, an expansive vocabulary, and mastery over syntactic structures.

Subsequently, the Fine-Tuning Phase ensues, serving to refine the model's comprehension through exposure to a meticulously curated dataset. This dataset is deliberately formulated with the collaboration of human reviewers, imparting a discerning precision to the iterative feedback loop. The essence of this phase lies in its targeted strategy, employing a constrained dataset to hone the model's behavioral nuances. Human reviewers occupy a pivotal role during this phase, meticulously adhering to OpenAI guidelines while perpetually scrutinizing and assessing the model's outputs. The cyclical nature of this feedback mechanism assumes paramount importance, contributing significantly to the cultivation of ChatGPT's ability to furnish responses that are not only logically coherent but also contextually apt and safe.

It is imperative to underscore that ChatGPT's functionality does not hinge upon direct memory utilization. Instead, it leverages acquired patterns to generate responses of notable quality. Nevertheless, the tenor of its

outputs is inherently influenced by the content to which it has been exposed and the attendant biases intrinsic to said content (Ray, 2023; Li, 2022; Kalla, 2023).

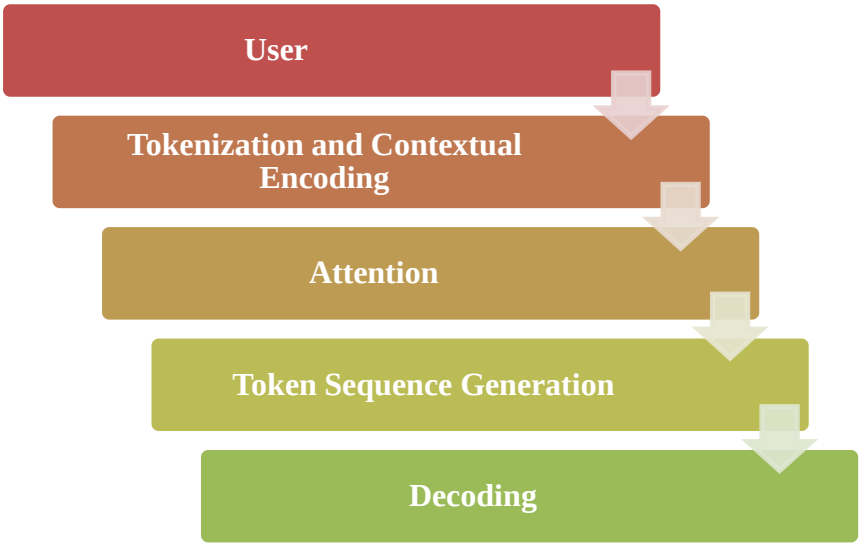
Data Sources

The efficacy of ChatGPT's training process is intricately linked to the characteristics of the datasets employed. In the initial pre-training phase, a comprehensive compilation of data extracted from diverse web sources plays a pivotal role in augmenting the model's predictive capabilities and fostering a nuanced understanding of linguistic structures. This phase is dedicated to cultivating the model's proficiency in predicting words within sentences, thereby contributing to the acquisition of grammatical intricacies and syntactic comprehension. Consequently, the fine-tuning phase is instituted, featuring a specialized dataset meticulously curated for the purpose. Human assessors actively engage in this phase, undertaking the responsibility of refining the model's behavioral nuances. Through their discerning evaluations, these assessors ensure that the model furnishes responses characterized by safety and coherence, thereby steering its outputs toward more contextually suitable expressions.

It is imperative to recognize that the generated responses are intricately connected to the data assimilated during both the pre-training and fine-tuning phases. This underscores the critical significance of dataset quality and diversity in shaping not only the predictive abilities of the AI model but also the overall performance and quality of its responses. The ensuing discussion delves into how the quality and diversity of datasets exert a direct influence on the performance and answer quality of the AI model.

ChatGPT Implementation and Functionality

Figure: Chat GPT Process Workflow



***Source*:** Authors own works

Architecture Overview

The practical manifestation of ChatGPT draws upon a sophisticated architecture rooted in deep neural networks enriched with layers of transformers. These transformers are meticulously crafted to excel in processing sequential data, granting them a profound aptitude for handling natural language text [4]. This amalgamation culminates in a model that showcases an exceptional knack for generating responses that resonate with human-like coherence (Kasneci, 2023).

Neural Network Architecture

At the nucleus of ChatGPT resides an intricate neural network architecture constructed upon the bedrock of transformer principles (Vaswani, 2017). These transformers unveil a remarkable capability for apprehending the contextual relationships embedded within data sequences—an indispensable attribute for the model's prowess in generating text (Torfi, 2020).

Training Data

The odyssey commences by immersing ChatGPT in expansive and diverse datasets (Ray, 2023). These repositories encompass a kaleidoscope of textual compositions, enabling the model to internalize the labyrinthine tapestry of patterns, nuances, and interconnections inherent in language (Voita, 2021). This phase, often dubbed pre-training, lays the cornerstone for the model's foundation of knowledge (Abdullah, 2022).

Tokenization and Encoding

As ChatGPT processes user inputs or prompts, the text metamorphoses into diminutive units known as tokens (Dwivedi, 2023). Each token is infused with contextual information, akin to distilling the essence of the text. This encoding methodology adorns the model with the capability to fathom and conjure up sequences of text that exude coherence (Li, 2022).

Attention Mechanism

The bedrock of the transformer architecture—the attention mechanism—unlocks the prowess of ChatGPT to discern the significance of words about each other (Vaswani, 2017). This mechanism mirrors the patterns of human attention, thus fueling the model's competence to yield responses that are both contextually apt and fluid (Abdullah, 2022).

Response Generation

Confronted with a user's input, ChatGPT harnesses its amassed knowledge to craft responses (Kalla, 2023). This process entails the unravelling of encoded tokens, ultimately culminating in formulating human-readable text—the outcome—responses that bear the hallmark of coherence and engagement (Elkins, 2023).

Human Feedback Loop

The ChatGPT expedition transcends its preliminary training. The model undertakes fine-tuning catalyzed by human feedback (Ray, 2023). Human evaluators assume a pivotal role in this process—scrutinizing and rating the model's responses. This iterative dance refines the model's behavior over time, fostering the production of responses that encapsulate coherence, contextual congruence, and safety (Sjödin, 2021).

Real-world Applications: ChatGPT's utility extends beyond theoretical realms once imbued with training and refinement. It finds footing in diverse real-world applications—from addressing user inquiries and content generation to language translation and even nurturing creative writing (Sallam, 2023). In essence, the orchestration of ChatGPT's implementation and functionality converges upon an intricate tapestry woven from the threads of sophisticated neural network architecture, expansive training data, astute attention mechanisms, and the nurturing touch of human feedback (Shen, 2023).

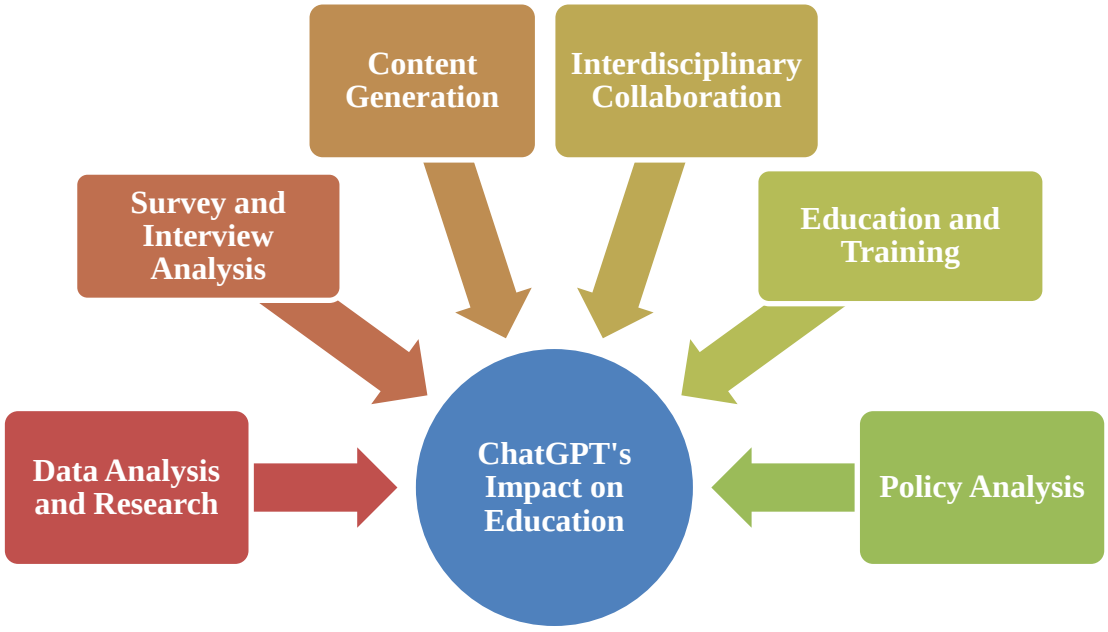
This symphonic interplay yields a technology that not only comprehends language but also crafts responses that emulate the ebb and flow of human conversation. Subsequent sections will venture into the riveting vistas of ChatGPT's applications within the sphere of social sciences—a realm brimming with transformative potential.

ChatGPT's Impact on Academic activities

ChatGPT's Impact on Data Analysis and Research

In social science research, ChatGPT emerges as a transformative force in data analysis (Ouyang, 2022). Its natural language processing prowess empowers researchers to navigate extensive textual datasets seamlessly (Perez, 2021). From academic papers to surveys, ChatGPT facilitates efficient data processing, enabling a more comprehensive information exploration (Burstein, 2019; Perez, 2021). The model's unique capabilities extend to information extraction and summarization, streamlining literature reviews and distilling key concepts precisely (Burstein, 2019; Miller, 2019). This expedites the initial stages of research and contributes to a more nuanced understanding of intricate subject matter (Miller, 2019). ChatGPT's proficiency in pattern recognition and trend analysis becomes instrumental in uncovering insights within datasets (Ouyang, 2022; Salah, 2023). It empowers researchers to identify emerging social phenomena and changes over time, providing a dynamic perspective for analysis (Ouyang, 2022; Salah, 2023). The time efficiency gained through ChatGPT's automation of tasks offers researchers a valuable resource (Ouyang, 2022; Floridi L. &., 2022). Freed from labor-intensive data processing, researchers can redirect their efforts towards higher-level tasks such as interpretation and theoretical development. This shift allows researchers to delve deeper into the nuances of the data and draw more meaningful conclusions.

Additionally, by automating repetitive tasks, ChatGPT reduces the chances of human error, ensuring the accuracy and reliability of the analysis. Beyond efficiency, ChatGPT facilitates a more inclusive research approach by analyzing public discourse from online forums and social media (Floridi L. &., 2022). This captures diverse citizen perspectives and enriches the contextual understanding of societal sentiments, contributing to more holistic analyses. In the realm of policy analysis, ChatGPT adds another layer of sophistication (Gill, 2023). Evaluating language and implications aids researchers in assessing policy impact on diverse demographic groups and identifying potential biases, thereby enhancing the depth of policy effectiveness assessments (Gill, 2023). ChatGPT's adaptability emerges as a unifying force, promoting interdisciplinary collaborations among researchers from diverse social science disciplines. Its multifaceted impact on data analysis amplifies the depth and efficiency of social science research endeavors (Jowarder, 2023).



Source: Authors own work

Survey and Interview Analysis

ChatGPT significantly revolutionizes on survey and interview analysis in the field of social sciences. Its impact spans various facets, from automating labor-intensive survey data coding (Brachman, 2022) to facilitating nuanced natural language understanding during interviews. The model operates as a versatile tool, seamlessly generating accurate interview transcripts (Gref, 2022), which is especially beneficial in managing extensive qualitative data sets. ChatGPT is a formidable ally in data analysis, supporting diverse methodologies like thematic analysis, cross-linguistic scrutiny, and qualitative data synthesis (Kusal, 2023). These functionalities empower researchers to derive valuable insights from vast qualitative information,

enabling the identification of intricate patterns and trends that might otherwise be challenging to discern. A pivotal role for ChatGPT lies in its ability to generate practical interview questions tailored to specific research objectives (Min, 2023). This not only expedites interviews but ensures a comprehensive exploration of key topics. ChatGPT's natural language processing capabilities allow it to adapt and refine interview questions based on the participant's responses, ensuring a dynamic and personalized conversation. This enhances the quality of data collected and saves researchers valuable time in the interview process. Moreover, its capacity to identify emerging trends proves instrumental in capturing the dynamic nature of social phenomena, significantly contributing to longitudinal studies and trend analyses. Beyond analysis, ChatGPT significantly contributes to creating interactive survey reports (Lowe, 2013),enhancing the accessibility and comprehensibility of research findings Additionally, in ethical considerations, ChatGPT aids researchers in navigating potential biases by flagging biases and ensuring the ethical handling of participant responses and data (Brachman, 2022). This aids in upholding the integrity of research outcomes. ChatGPT is a transformative force, enhancing both efficiency and depth in survey and interview analysis. Providing comprehensive support empowers researchers to extract nuanced and meaningful insights from qualitative data in social sciences, enriching the landscape of academic inquiry.

Content Generation

ChatGPT assumes a pivotal role in automating the drafting of reports and articles within social science research (Dwivedi, 2023). Its versatility allows for emulating diverse writing styles, mirroring various academic tones and significantly streamlining the publication process. The model excels in transforming raw data into coherent and comprehensible narratives while offering suggestions for visualizations, enhancing the presentation of complex information (Diwan, 2023). Researchers leverage ChatGPT's capabilities within hypothesis formulation to systematically articulate and explore potential hypotheses. This structured approach aids in refining research directions and hypothesis development. Moreover, in terms of public engagement, the model catalyzes the creation of interactive content, such as chat-based interfaces, surveys, and educational materials, fostering increased interaction and accessibility (Jowarder, 2023). Researchers capitalize on ChatGPT's capabilities to generate scenario-based simulations for experiments and to craft succinct yet comprehensive policy briefs and recommendations (Ray, 2023). The model's adaptability allows content customization tailored to different stakeholders, enabling precise communication aligned with specific audience preferences and needs. Beyond its proficiency in English, ChatGPT's multilingual capabilities stand out, proving invaluable for international research endeavors (Jelinek, 2021). It facilitates the concise summarization of complex concepts, ensuring

accessibility for diverse audiences globally. ChatGPT significantly amplifies the efficiency and effectiveness of content generation in social science research by offering a multifaceted suite of tools for various stages of the research process. ChatGPT revolutionizes language translation within social sciences, acting as a catalyst for multilingual research collaboration (Diwan, 2023). Researchers leverage the model to seamlessly translate findings, surveys, and engagement materials, ensuring global accessibility and inclusivity across linguistic boundaries (Bang, 2023). By dismantling language barriers, ChatGPT provides access to a broader academic discourse, enriching literature reviews and augmenting the contextual depth of social science research (Jowarder, 2023). ChatGPT in social sciences facilitates cross-cultural understanding and enables researchers to engage with diverse perspectives worldwide. This enhances the quality and validity of research findings and promotes a more inclusive and comprehensive approach to studying complex social phenomena (Craig, 2004). Its role in aiding non-native English speakers in accessing scholarly information significantly contributes to a more interconnected global research community.

In policy communication, ChatGPT emerges as an invaluable tool for translating intricate documents and facilitating the dissemination of policy recommendations on a global scale. Its real-time language support during virtual collaborations ensures effective communication among researchers from diverse linguistic backgrounds, fostering a more cohesive and collaborative research environment. The model extends the reach of social science research by transcending language barriers, enabling the translation and analysis of content across diverse languages. This capability offers insights into global public sentiments and promotes a more comprehensive understanding of cross-cultural perspectives. Overall, ChatGPT plays an indispensable role in rendering research outputs more accessible and in nurturing a more inclusive, connected, and globally engaged landscape for social science research.

Interdisciplinary Collaboration

ChatGPT acts as a uniting factor, seamlessly linking scholars across many social science areas. It works as a shared language, enabling straightforward communication and mutual understanding among team members from different fields. In interdisciplinary teams, ChatGPT assists in idea generation by presenting varied views. Researchers input initial hypotheses, and the model generates content that blends insights from many fields, generating innovative and complete ideas. The approach facilitates synthesizing disparate data kinds, providing for a consistent representation of information and supporting thorough analyses spanning multiple disciplines. By leveraging team members' diverse perspectives and

knowledge, ChatGPT enhances the collaborative problem-solving process. It encourages brainstorming sessions where individuals can contribute their unique expertise, leading to a more comprehensive understanding of complex problems.

Additionally, the model's ability to generate content that integrates insights from different fields promotes interdisciplinary research and fosters creativity in finding novel solutions. It plays a significant role in collaborative literature reviews, speeding the review process and ensuring a more comprehensive knowledge of cross-disciplinary research. ChatGPT promotes cross-functional project management in interdisciplinary projects by assisting in developing project documentation, progress reports, and communication materials adapted to various expertise. Researchers employ ChatGPT for cross-disciplinary workshops, grant proposal drafting, and the formation of cross-disciplinary research centres. The model's language-generating skills contribute to productive collaboration and the success of interdisciplinary research projects.

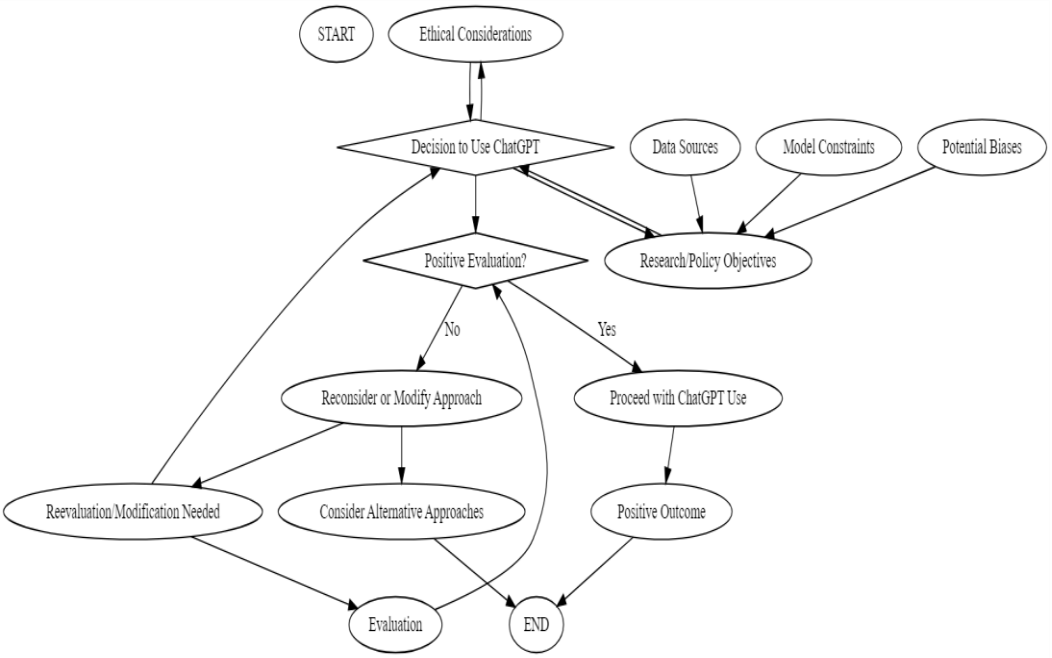
Education and Training

Chat GPT changes education in social sciences by contributing to increased learning materials, tailored tutoring, and language learning help (Craig, 2004). It provides automated evaluation and feedback, easing grading processes for educators (Dixson, 2016). In educational settings, ChatGPT facilitates in producing simulation-based learning experiences and generating course content, including lecture notes and presentations (Morel, 2022). It supports professional development for educators, providing training materials and resources for ongoing learning (Darling-Hammond, 2009). Additionally, ChatGPT offers personalized learning experiences by adapting to individual student needs and preferences (Baidoo-Anu, 2023). It can also assist in creating interactive exercises and quizzes to enhance student engagement and knowledge retention (Liu, 2019). For online education, ChatGPT promotes accessibility by delivering real-time support and fostering engaging discussions. It also adds to research methodology courses by generating examples and explanations (Morel, 2022). The model's language translation skills play a role in global education, enabling the translation of instructional content into multiple languages (Baidoo-Anu, 2023). Overall, ChatGPT positively influences both student learning experiences and the professional growth of instructors in social sciences.

Policy Analysis

ChatGPT greatly influences policy analysis in social sciences by automating document summarization, enhancing language clarity, and supporting scenario-based simulations (Liu, 2019; Nannini, 2023).

Figure: Framework for ChatGPT Implementation in Research and Policy Analysis



Source: *Authors own work*

It engages stakeholders by evaluating public attitudes and enabling timely solutions to emergent policy challenges (Gerlich, 2023). Analysts utilize ChatGPT to analyze policy choices, considering variables such as efficacy and feasibility (Feng, 2023). The methodology contributes to ethical issues and cultural nuances within policy language, encouraging inclusivity in suggestions (Cachat-Rosset, 2023). ChatGPT's natural language processing capabilities allow for identifying potential biases in policy language, promoting fairness and equity in decision-making processes. Additionally, its ability to generate alternative policy scenarios helps policymakers explore a broader range of options and anticipate potential outcomes before implementing any changes.

ChatGPT increases public engagement in policy discourse by creating accessible summaries of policy materials. It also helps historical policy analysis, providing insights into the change of policies throughout time. The approach assists policy monitoring in real-time by assessing news, social media, and public discussions (Ofli, 2022). ChatGPT streamlines and improves the policy analysis process, helping to create more informed, inclusive, and adaptive policymaking in social sciences.

Ethnographic Research

Ethnographic research is another area where ChatGPT can be beneficial. By leveraging its natural language processing capabilities, ChatGPT can assist

researchers in analyzing qualitative data collected during fieldwork. This can lead to a deeper understanding of cultural practices, social dynamics, and the lived experiences of different communities. Additionally, ChatGPT's ability to generate human-like responses can facilitate more engaging and insightful interviews with participants, enhancing the overall quality of ethnographic research. ChatGPT alters ethnographic research by automating data categorization and analysis, aiding cross-cultural studies through language translation, and boosting participant engagement with culturally sensitive communication. It creates theme content and helps real-time field note documentation during fieldwork. The approach also assists in cultural sensitivity training, assuring courteous interactions with participants. It stimulates cross-disciplinary collaboration among ethnographers and facilitates the construction of interactive data visualizations to share research conclusions more effectively. Regarding ethical aspects, ChatGPT helps design culturally sensitive interview questions and permission documents. It contributes to the historical contextualization of ethnographic data, integrating temporal dimensions to fully comprehend cultural changes throughout time. ChatGPT enriches the depth and efficiency of ethnographic studies, fostering nuanced insights into varied cultural situations (Zambrano, 2023).

Challenges, Ethics, and Solutions for what

Reliance on AI: Bias and Privacy Concerns

Deploying AI models like ChatGPT raises issues about intrinsic biases buried in the training data. Research has revealed that AI models trained on historical information can perpetuate societal biases. Mitigating these biases becomes crucial to ensure the impartiality and inclusivity of social sciences research (Buolamwini, 2018). Furthermore, utilizing AI in sensitive sectors such as healthcare and criminal justice might have substantial ethical consequences. For instance, depending only on AI algorithms for decision-making may jeopardize individual privacy rights and result in biased decisions. Therefore, it is necessary to build comprehensive standards and laws to address these problems and ensure responsible and ethical deployment of AI technologies. The application of AI includes analyzing vast volumes of data, frequently sensitive. Ensuring data privacy, storage, and honest information management becomes a serious concern. Ethical frameworks and strict data protection procedures are essential to guarantee the anonymity of individuals and adhere to ethical norms in research (Heurix, 2015).

Ethical Implications in AI Integration

Studies underline the need for varied datasets and thorough monitoring during the training phase of AI algorithms to counter biases. This is vital to ensure fairness and accuracy in AI systems, as biased data can perpetuate

discrimination and injustice. Additionally, it is vital for researchers and developers to regularly examine and address potential ethical concerns that may come from the usage of AI technology, such as privacy violations or the possibility of exploitation of personal data. Incorporating various perspectives in training data and using algorithms that actively minimize biases are essential approaches (Zittrain, 2019). These measures can minimize the influence of biased data and guarantee that AI systems are more inclusive and equal.

Moreover, fostering transparency and accountability in developing and deploying AI technology is vital to generating trust among users and stakeholders. Transparency in AI algorithms is critical. Scholars argue for transparent models, allowing stakeholders to comprehend decision-making processes. Establishing ethical rules and frameworks for AI deployment in social sciences research supports accountability and responsible actions (Mittelstadt, 2016).

Responsible AI Integration in Social Sciences

Integration of ethics education regarding AI in social sciences curricula is paramount. Educating students and researchers about the ethical implications of AI models like ChatGPT empowers them to navigate ethical challenges in research. (Floridi L. C., 2021). Institutions should establish dedicated, ethical review boards or committees to oversee AI-driven research projects. These bodies ensure adherence to ethical standards, offering guidance on responsible AI integration and ethical practices in social sciences research.

Table*:* Future Implications of ChatGPT in Social Sciences

Source: *Generated by the authors*

Advancements on the Horizon

The evolving landscape of technology paints a promising picture for ChatGPT's role in reshaping social sciences education. As ChatGPT continues to improve and become more sophisticated, it has the potential to revolutionize the way social sciences are taught and studied. By leveraging its vast knowledge base and natural language processing capabilities, ChatGPT can provide students with personalized learning experiences,

allowing them to engage in dynamic conversations and explore complex concepts in real time. This enhances their understanding of the subject matter, fosters critical thinking skills, and encourages collaborative learning. Moreover, the integration of ChatGPT in social sciences education With the continuous advancements in natural language processing and machine learning, ChatGPT has the potential to revolutionize how social sciences are taught and studied. Its ability to engage in meaningful conversations and provide instant feedback can enhance students' understanding of complex concepts and foster critical thinking skills.

Furthermore, by analyzing vast amounts of data and generating insights, ChatGPT could contribute to groundbreaking research in various social science disciplines, leading to discoveries and innovative approaches to societal challenges. As advancements continue, ChatGPT stands poised to redefine the learning and research paradigms within the faculty of social sciences. Its trajectory suggests a future where it becomes instrumental in several crucial aspects.

Enhanced Capabilities

Anticipating the future trajectory of ChatGPT reveals a landscape where this AI language model continues to augment its capabilities. These enhanced capabilities include improved natural language understanding, generating more nuanced and contextually appropriate responses, and even the potential for ChatGPT to engage in meaningful and insightful conversations with users. With these advancements, ChatGPT could become an invaluable tool for social scientists, assisting in data analysis, hypothesis generation and even providing new perspectives on complex social issues. With ongoing advancements, ChatGPT is expected to improve its ability to understand and generate complex social science concepts and theories. This would enable it to provide more nuanced and insightful responses, making it an invaluable tool for students and researchers in the field. Additionally, as ChatGPT learns from a vast amount of data, it has the potential to offer personalized learning experiences tailored to individual students' needs, fostering a more engaging and effective educational environment. It is anticipated to bolster its role in facilitating various facets of education:

Learning Facilitation: ChatGPT is projected to become more adept at tailoring educational content, catering to diverse learning styles, and offering personalized learning experiences for students in social sciences disciplines. For example, it could provide real-time feedback and suggestions to help students improve their writing skills or deliver interactive simulations and visualizations to enhance understanding of complex concepts. ChatGPT could also assist teachers in creating customized lesson plans and assessments based on individual student progress and areas of improvement.

Research Support: Its capacity to assist in research endeavors is expected to expand, aiding in more intricate data analysis, comprehensive literature reviews, and creativity for innovative research methodologies. Furthermore, ChatGPT's ability to process vast amounts of information quickly can help researchers identify patterns and trends that may have been overlooked. This can lead to more accurate and insightful findings, ultimately advancing the field of research. Additionally, ChatGPT's natural language processing capabilities can assist in generating hypotheses and refining research questions, saving researchers valuable time and effort in the initial stages of their projects.

Ethical AI Integration: Future iterations of ChatGPT are anticipated to prioritize and embed ethical considerations more seamlessly, aligning with responsible usage within the social sciences education framework. This integration will ensure that ChatGPT's use in research adheres to ethical guidelines and safeguards against potential biases or harm. By incorporating ethical considerations, researchers can confidently utilize ChatGPT as a tool for unbiased and responsible data analysis, contributing to the overall integrity of their research outcomes.

Conclusion

The influence of ChatGPT on the social sciences is noteworthy, manifesting in enhanced data analysis methodologies and a transformative shift in educational paradigms. The model's proficiency in generating human-like responses has not only expanded the horizons of inquiry in psychology, sociology, and linguistics but also holds the promise of reshaping how we investigate and comprehend human behavior. The continued expansion of ChatGPT carries the potential for groundbreaking discoveries and advancements within the realm of social sciences.

Nevertheless, this transformative journey is not without ethical questions and challenges that warrant persistent attention and proactive responses. The burgeoning field of AI, as embodied by ChatGPT, introduces concerns pertaining to privacy, data security, and biases that demand careful consideration. The responsible integration of AI in social sciences necessitates the formulation and implementation of comprehensive policies and procedures, ensuring ethical and transparent utilization of these advanced technologies.

As the trajectory of AI expansion unfolds, the critical need for ongoing scrutiny and conversation becomes evident. These deliberations are indispensable for addressing emerging ethical challenges and mitigating potential risks associated with the evolving landscape of ChatGPT and similar AI models. It is through this careful navigation of ethical considerations that the model, as it evolves, is poised to play a pivotal role in advancing our understanding of human behavior and societal structures within the intricate domain of social sciences.

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