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Oilfield Services and Soil
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Analysis of Outcome based
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IMAGE: ACROPOLIS OF ATHENS,
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School Enrollment Factors for Children Aged 6 to 11 in Benin

Guy Armand Onambele & Odette Semevo

ABSTRACT

Although Sustainable Development Goal #4 is requesting universal quality education for all countries, household characteristics do not facilitate education for all children. This study analyzes the factors that influence school enrollment of 6-11 aged in Benin through binomial logistic regression and prioritization. The results reveal that children's school enrollment is influenced by the spouse's literacy, the household's standard of living, the woman's level of education, the woman's age, the child's sex, and the type of union between the parents. Women's participation in decision-making within the household plays an important role. The ways forward are to perpetuate schooling policies targeting girls and to strengthen household's economic capacities in order to mitigate their vulnerability.

Keywords: education, children, decision-making, living standards, gender.

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School Enrollment Factors for Children Aged 6 to 11 in Benin

Guy Armand Onambebe^α & Odette Semevo^σ

ABSTRACT

Although Sustainable Development Goal #4 is requesting universal quality education for all countries, household characteristics do not facilitate education for all children. This study analyzes the factors that influence school enrollment of 6-11 aged in Benin through binomial logistic regression and prioritization. The results reveal that children's school enrollment is influenced by the spouse's literacy, the household's standard of living, the woman's level of education, the woman's age, the child's sex, and the type of union between the parents. Women's participation in decision-making within the household plays an important role. The ways forward are to perpetuate schooling policies targeting girls and to strengthen household's economic capacities in order to mitigate their vulnerability.

Keywords: education, children, decision-making, living standards, gender.

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I. INTRODUCTION

Benin is a country in West Africa with about 12 million inhabitants. Like most countries, Benin is in line with the Sustainable Development Goals. According to the fifth Demographic and health survey data set (Benin DHS 5, 2017-2018), the gross attendance rate in primary school is 89%, with a gap between girls and boys (94% for boys and 84% for girls) and the net rate is 65%, again with a gender gap to the disadvantage of girls. Thus, it should be noted that efforts still need to be made to achieve full enrollment of children in school. Concerning decision-making within the household, the fifth Demographic and health survey data reveal that in relation with women's

health, only 11.5% of women decide alone, in 34.8% of cases, the decision is joint (both parents) and in 53.1% of cases, it is the man alone who decides on behalf of woman. Regarding essential household purchases, 8.8% of women decide alone; in 38.4% of cases, the decision is joint and in 52.1% of cases, it is the man alone. What about decision-making for child school enrollment?

Universal quality education is part of the 17th Sustainable Development Goals to be reached by 2030. This work examines the relationship between household characteristics and school enrollment of children aged 6-11 in Benin. We are interested in the age group of children likely to be enrolled in primary school. The official age of entry into primary school in Benin is 5 years. But not all 5-year-olds are likely to be enrolled in primary school, so to have statistics of children actually in the education system, we considered 6-year-olds. In addition, primary education consists of six years of study. For these reasons, we considered the 6-11 age group.

The general hypothesis underlying this study is that household characteristics influence children's school enrollment.

1.1 Literature Review

Education is a crucial element in the life of every individual in society. According to UNESCO, it is a set of means allowing the development of the physical, moral, and intellectual faculties of a human being. The right to education is unique and necessary because it empowers individuals to exercise all their other rights (civic, political, economic, social, or cultural), giving them the opportunity to live a dignified life, while ensuring a better future for all. Education is also a means of empowering children and even adolescents to become active participants in the transformation of the societies in which they live (INSAE, 2018).

Achieving the goal of education for all that most countries advocate in the context of sustainable development implies putting all children, both boys and girls, in school.

Despite the importance of education and the policies put in place by governments, we note that not all children are enrolled in school, and inequalities are observed across countries, and within each country. Several factors certainly describe this observation. There has been considerable discussion of the factors that explain children's schooling, as well as the factors that influence women's participation in household decision-making. But, to date, relatively little work has examined the influence of couples' joint participation in household decision making on children's schooling. Empirical studies that determine the factors influencing children's education have yielded multiple and diverse results depending on the context.

1.1.1 Impact of Living Standards

Studies in the West African sub-region have shown that in wealthy and female-headed households, children are more likely to attend school (Alis Bambara and Madeleine Wayack-Pambè, 2019). In Togo, for example, more than 60% of children from wealthy households are enrolled in school, while only 15% of children from poor households are schoolarised. Children from poor households are engaged in paid work to support their families (Vissého Adjiwanou, 2005). In studying the effect of household standard of living on school completion in twenty-five countries, Filmer D. and Pritchett L., (1999) found that in Benin, with data from the 1993 demographic and health survey, the completion gap in primary school is 41.1%; 39.5% and 19.3% respectively for poor, middle and wealthy households. In Burkina Faso, for example, Dramane Boly (2017) found that the standard of living is a determining factor in children's schooling. These studies, therefore show that the household's standard of living has a significant influence on children's school enrollment and completion. Okurut, F.N. and D.O. Yinusa, (2010) also found that in Botswana,

children living in female-headed households are more likely to be enrolled in school.

1.1.2 Age Range Effect and Social Network

Analyzing household characteristics, Chabi M. and Attanasso O. (2015) found that the presence of children under 6 years old in a household puts pressure on the household's resources, and therefore, influences the schooling of the household's children. This age range (6-11 years) corresponds to the official age for being in primary school. In a situation of limited resources, the presence of this age range puts pressure on the household's resources, and therefore affects the chance that all children to attend school. On the other hand, Moussa B. et al (2014) assessed the combined effect of family networks and sibling size on children's schooling and concluded that there is a positive relationship between an increased number of children and the use of family mutual aid for children's education. This is due to the fact that parents with a high number of children depends on social networks to send their childrens to school more than those with fewer children.

1.1.3 Gender and Family Relationship

Individual characteristics of children are also elements that influence their enrollment. Some authors have shown in their work that being female is negatively associated with the probability of enrollment and attainment of a high level of education. Girls are a cheaper source of labor for agricultural, household, and commercial activities, so mothers cannot do without their contribution. As a result, parents choose to keep girls at home and give priority to boys (Lokonon P., 2018). Further on, Dramane B. (2017) shows that in Burkina Faso, girls who are not related to the head of the household are less likely to attend school due to their use in domestic work. In Mali, Kuepie M. and Misangumukini N. (2012) found that permanent resource constraints have a more significant impact on girls' schooling than on boys'. Similarly, these authors find that girls' school success is sensitive to the educational capital of the adults in the household.

1.1.4 Parent's Education, Literacy and Occupation

Parental characteristics are listed among factors that affect children's school enrollment. A study conducted on dropout: differentials and factors associated with dropout in India (Gouda and Sekher, 2014) found that the dropout rate among children of illiterate parents is four times higher than among literate parents. Similarly, the likelihood of dropping out is high among children whose parents do not work. In Burkina Faso, for example, research on women's participation in household expenses and women's decision-making role in children's schooling has shown that mothers' education is a determining factor in their children's schooling (Madeleine Wayack- Pambé, 2007).

1.1.5 Decision-Making

The relationship between spouses, particularly the possibility for each of them to participate in household decisions, is an important indicator of gender relations in society and contributes to the well-being of the entire family. Thus, some gender studies have been conducted to determine the factors contributing to women's participation in household decision-making. For example, it is known that women's participation in the modern labor market or paid work, older age, urban residence, type of union, and access to the media are factors that positively influence their participation in decision-making within their households (Thionbiano, 2014; Ampale, 2015). The International Food Policy Research Institute (UNICEF 2007), reveals that if men and women had equal influence in household decision-making, the incidence of underweight children under three years of age in South Asia could be reduced by 13 percent, resulting in 13.4 million fewer malnourished children in the region. Similarly, in sub-Saharan Africa, 1.7 million more children would be adequately nourished based upon gender balance in decision-making. One would expect this gender equality to be a factor in getting children into school.

II. MATERIALS AND METHODS

2.1 Sampling

The data used are from the Benin Demographic and Health Survey conducted in 2017-2018. Our base consists of women aged 15-49, men aged 15-64, and children aged 6-11. In total, we have 13,958 children and 4,035 couples.

The dependent variable in this study is the school enrollment of children aged 6-11 at the time of the survey. It is a binary variable taking the value 1 when the child is enrolled in school and 0 otherwise.

The independent variables are: for the household (standard of living, area of residence, type of union); for the child (sex); for the mother/caregiver of the child (participation in decision making on health and household priority expenditures, education level, age, current occupation); for the father/guardian of the child (participation in decision-making on health, household priority expenditures, education level, age, current occupation) The "participation in decision-making" variable is a composite. It was designed by considering cases where the woman/man decides alone, jointly with her/his partner and does not participate in the decision on health and priority household expenses.

2.2 Data Analysis

The analysis has two components: descriptive (univariate, bivariate) and explanatory (binomial logistic regression and prioritization). The bivariate analysis measures the association between the dependent variable and the independent variables and is verified by a Chi2 test at the 5% threshold.

The explanatory component through binomial logistic regression allows us to measure the net effect of each of the independent variables on children's school enrolment. The choice of this analysis model is justified by the qualitative and dichotomous nature of the dependent variable.

As for prioritization, it allows us to see the level of contribution of each factor to the explanation of children's school enrolment. The process consists

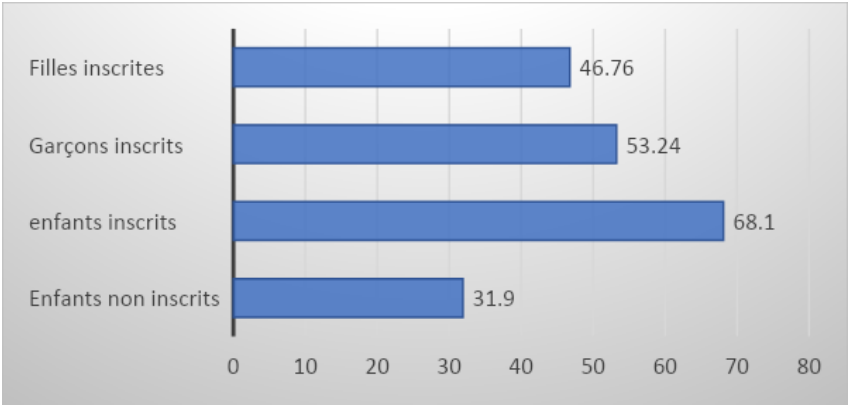
of taking the difference between the Chi-square of the final model, including all the variables, and the Chi-square obtained from the model without the variable, and relating the result to the final Chi-square to obtain the contribution of the variable in explaining the phenomenon.

III. RESULTS AND ANALYSIS

3.1 Sample Description

3.1.1 Children Characteristics

About 7 out of 10 school-age children (68.1%) are enrolled in school. More boys (53.24%) than girls (46,76%) are enrolled in school.

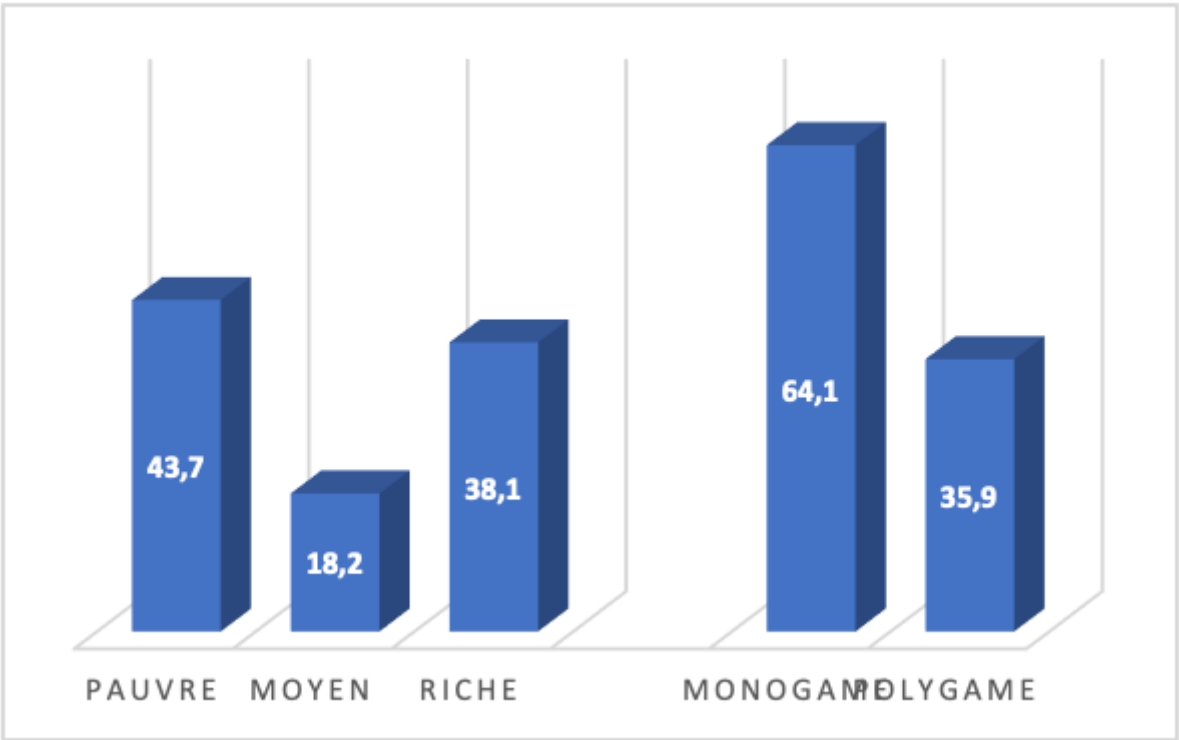


Source: Benin DHS 5, 2017-2018

Figure 1: Proportion of children enrolled or not in school by gender

3.1.2 Household Characteristics

According to this study, 43,7% of households have a poor standard of living and 38,1% have a rich standard of living. Most households are monogamous (64,1%).



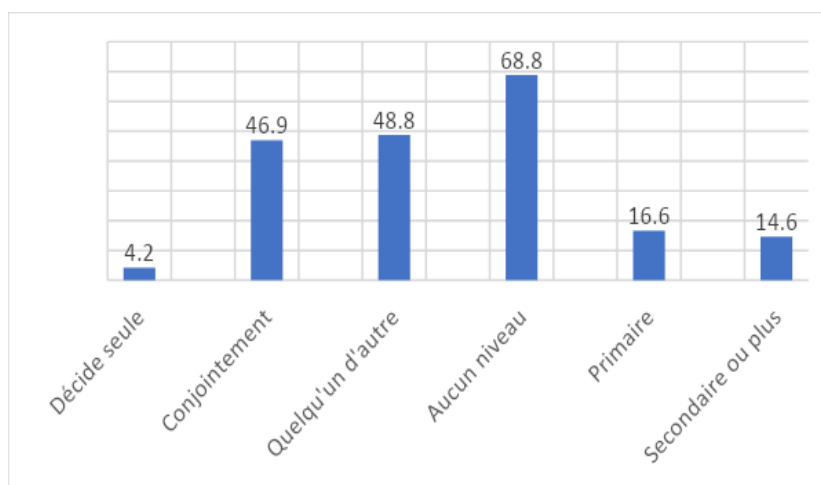
Source: Benin DHS 5, 2017-2018

Figure 2 : Distribution of households by standard of living and type of union

3.1.3 Women Characteristics

The majority of women have no education (68.8%). Respectively 16,6% and 14,6% have a

primary and secondary level or more. Very few women (4,2%) decide alone when it comes to their health care and significant household purchases.

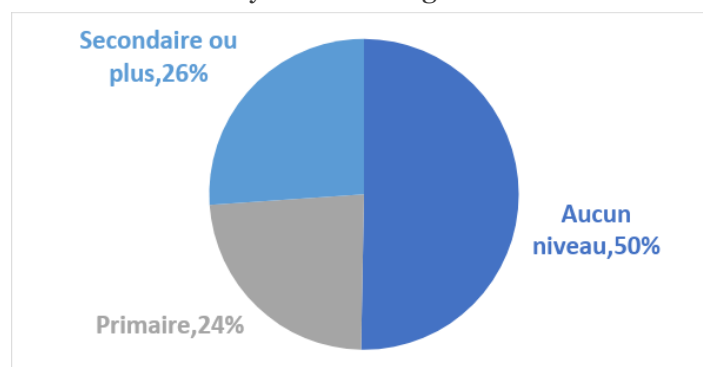


Source: Benin DHS 5, 2017-2018

Figure 3: Distribution of women according to their level of participation in decision-making and their level of education

3.1.4 Men Characteristics

One in two fathers/guardians has no education (50%). For those who are schoolarised, 24% have reached primary school and 26% secondary school or higher.



Source: Benin DHS 5, 2017-2018

Figure 4: Distribution of men by education level

3.2 Analysis

3.2.1 Bivariate

The results of the bi-variate analysis showed that, with the exception of participation in decision-making from men's statements and the gender of the head of household, all variables are significantly associated with school enrollment of 6–11-year-olds at the 5% threshold.

3.2.2 Logistic Regression

3.2.2.1 Household's characteristics

The type of union that links parents influences the schooling of children aged 6–11. Children living in a polygamous household are 0.76 times less likely to be enrolled than those in a monogamous household. Household's standard of living was found to be highly significantly associated with

children's school enrollment. Thus, children living in families with a middle or wealthy standard of living are 1.86 and 3.72 times more likely to be enrolled than their counterparts living in poor households, respectively.

3.2.2.2 Children's characteristics

The results show that, at the 5% level, the gender of the child has a significant association with school enrollment. Thus, the results show that girls are 0.81 times less likely to be enrolled than boys.

3.2.2.3 Mother's Characteristics

Concerning the mother's characteristics, the results show that the woman's involvement in decision-making is significantly associated with children's school enrollment at the 1% level. Thus, children whose mothers or guardians make decisions alone or jointly are respectively 1.94 and 1.44 times more likely to be enrolled than their counterparts whose mothers or guardians are not involved in decision-making.

3.2.2.4 Parent's education and literacy

At the 1% level, maternal education is positively associated with children's school enrollment. Thus, children whose mothers or guardians have primary and secondary education or more are 1.64 and 2.68 times more likely to be enrolled than children whose mothers have no education.

3.2.2.5 Parent's Age Range

Children whose mothers or janitors are between the ages of 30-39 and 40-49 are, respectively 1.59 times and 1.83 times more likely to be enrolled in school than their counterparts whose mothers are between the ages of 15-29 at the 1% threshold.

3.2.2.6 Parent's occupation

In contrast to the previous woman's characteristics, her current occupation is not significantly associated with children's school enrollment.

3.2.2.7 Spouse/Guardian's Characteristics

When analyzing the results according to the characteristics of the spouse or guardian, the results show a negative (non-significant) association between the spouse's participation in decision-making and the children's school enrollment. Like the woman's level of education, the spouse's level of education shows a positive association with children's school enrollment at the 1% threshold.

3.2.2.8. Father/Guardian's Characteristics

Children in households where the father/guardian has a primary and secondary level or higher education are respectively 6.12 and 3.40 times more likely to be enrolled than those living in a household where the father/guardian has no education. The results show that the age of the father/guardian and his current occupation are not significantly associated with children's school enrollment.

3.2.3 Prioritization of Factors

Table 2 below shows factors that influence children's school enrollment, classified according to their importance : the spouse's level of education, the household's standard of living, the woman's level of education, the women's participation in decision-making, the woman's age, the child's sex and the type of union.

Table 2 : Hierarchy of explanatory factors

Explanatory variables	Final chi- square	Chi-square without the variable	Contribution (%)	Rank
Spouse's level of education	759,20	702,22	11,13	1 ^{ier}
Household standard of living	790,20	709,20	10,25	2 ^{ème}
Woman's level of education	759,20	772,05	2,29	3 ^{ème}
Women's participation in decision-making	790,20	773,59	2,10	4 ^{ème}
Age of the woman	759,20	775,54	1,85	5 ^{ème}
Sex of the child	759,20	785,59	0,58	6 ^{ème}
Type of union	790,20	789,19	0,12	7 ^{ème}

Source: Benin DHS 5, 2017-2018

IV. DISCUSSIONS

This study aimed to analyzing the influence of household characteristics on school enrollment of 6–11-year-olds in Benin. Similar works generated the same findings focusing on the impact factors.

4.1 Spouse's Level of Education

About the characteristics of the spouse, the latter's level of education is a factor that is significantly associated with children's schooling. We can thus say that the more educated the parents are, the better they understand the importance of sending their children to school. Mabrooka Altaf, Tusawar Iftikhar Ahmad, Muhammad Azhar Bhatti, (2022) highlighted maternal education as the most influential and decisive factor in enhancing school enrollments of male children and female children in Pakistan.

4.2 Household Standard of Living and Socio-Cultural Patterns

Similar to studies carried out by Adjiwanou (2005) and Bambara and Wayack-Pambè (2019), we reached findings showing that the household's standard of living is determining children's school enrollment. Thus, children in wealthy households are more likely to be enrolled than those in poor families. These results also confirm the study by Filmer and Pritchett (1999), who found that in Benin, with data from 1993 Demographic and Health Survey, the primary school completion gap is 41.1%, 39.5% and 19.3%

for the poor, middle and rich households respectively. This could be explained by the fact that wealthy households can meet the costs of sending their children to school, which is not always the case for poor families. In the Beninese context, the low enrollment rate of girls in school could be explained by the fact that girls constitute an essential workforce for mothers. They help their mothers on the one hand to take care of their younger brothers, on the other hand, to help mothers in their activities. In a socio-cultural context, parents consider the girl as the property of another person from the moment she gets married. So sending her to school would be an additional expense for them with no benefits.

In addition, using data from the 1968–2013 October Current Population Survey to document trends in 3- and 4-year-old children's enrollment in center-based early childhood education, Katherine Magnuson and Jane Waldfogel (2016) have tried to focus on gaps in enrollment among children from low-, middle-, and high-income families. They found that income-related gaps in enrollment widened in the 1970s and 1980s but appear to have plateaued or narrowed for succeeding cohorts. These patterns are consistent with recent trends in income-related gaps in school achievement.

4.3 Woman's Level of Education

The level of education of mothers was found to be significantly associated with children's schooling.

This importance of mothers' education has been highlighted by other studies (Madeleine Wayack-Pambe, 2007; Caroline, Sascha, Leslie, & Han, 2021; Gouda and Sekher, 2014), which led to the results that the dropout rate among children of illiterate parents is four times higher than that of literate parents.

Throughout Ghana Living Standard Survey round 6 (GLSS 6) data, Abdul Malik Iddrisu, Michael Danquah and Peter Quartey (2017) demonstrated that parental education, household income and the gender of the head of the household are significant factors in households' children's schooling decisions. Educated parents are more likely to enroll their children in primary school and keep them until they complete primary education. The authors observed that educated parents do not promote a gender-biased investment in the schooling of children at the primary level. In addition, household welfare has a positive impact on children's completion of primary school.

4.4 Women's Participation in Decision-Making

Concerning factors related to parents, the results showed that women's participation in household decision-making is a factor positively associated with children's schooling. We can therefore affirm that a more egalitarian gender relations within couples that gives women the right to intervene in decision-making is, in turn, a factor that promotes children's education. Thus, women have a positive influence on children's education when they intervene in household decisions.

4.5 Age of the Woman

An advanced age of mothers is a favorable factor for the schooling of children. We can thus say that an advanced age confers more maturity, and respect to women and consequently, they can positively influence the education of their children. At slightly older generations, women become aware of the importance of sending their children to school.

4.6 Sex of the Child

The results showed that girls are more likely to be less educated than boys. Thus, the female gender is negatively associated with being in school. This reality was revealed by the DHS-V data (2017-2018). According to this survey, despite all the policies put in place by the authorities to encourage the enrollment of girls in school, there is a gap (10 percentage points) to be filled between boys' gross enrollment rate (94%) and girl's gross enrollment rate (84%). Uzma Naz, Zainab Ejaz and Naveed Khan (2019) analyzed major factors responsible for high dropouts in rural areas in Islamabad (Pakistan). Besides the distance from school to home, financial constraints is the most crucial reason for dropping out. Moreover, the education of the father, the age of the child, and the gender of the child are also highly significant variables that determine the probability of a child dropout.

4.7 Type of Union

The results of the explanatory analysis showed that the type of union in which a child lives influences their schooling to the extent that a child in a polygamous household is likely not to be enrolled in school. This could be explained by the fact that in a polygamous family there are several children, which increases the burden of schooling on parents, so they tend to enroll some children at the expense of others. This result is similar to work done by Attanasso M.O. and Chabi M. (2015), who found that the number of children under the age of 5 and the number of children in the 6-11 age group are variables that negatively affect school enrollment or level. That implies in a polygamous household, there would be many children in these age groups.

V. CONCLUSIONS

The purpose of this study was to examine the influence of household characteristics on the school enrollment of 6–11-year-olds. After presenting the context of the study, and the empirical work done by other researchers, we found that several factors directly influence children's school enrollment.

The data used in this study came from the fifth Benin Demographic and Health Survey (DHSB 5, 2017-2018). Our target population was women aged 15-49 and men aged 15-64 who were in a union or living with a partner at the time of the survey, as well as children aged 6-11 living in households. Both descriptive and explanatory methods of analysis were used in this study.

The descriptive analysis method allowed us to test the relationship between children's school enrollment and all the variables in the study at the bivariate level. An explanatory analysis based on binomial logistic regression allowed us to determine the factors that, in addition to the joint participation of couples in household decisions, influence children's schooling.

We found that the spouse's level of education, the household's standard of living, the woman's level of education, the women's participation in household decision-making, the woman's age, the child's sex, and the type of union are the factors that influence children's school enrollment in order of importance.

Despite the findings, this study does not claim to have covered all aspects of couples' joint participation in household decisions and all factors that might influence children's school enrollment. Thus, it should be noted that this study has some limitations. Not all variables related to household decision-making were included. It should also be noted that there is no specific question in the database on decision-making regarding children's education. However, this could more easily help to identify the parent who contributes most through their decision to the enrollment of children in the household. Nevertheless, these limitations do not alterate the results of our study. This study is very important for drawing a streamline to design better policy actions in favor of children's schooling.

Given the findings of our study, we recommend that schooling policies be perpetuated. Because today's children will be tomorrow's parents, the education of their offspring will be impacted by their literacy or education level. It's also recommended to carry out more policies to strengthen the economic capacities of households.

ANNEXES

Table 1: Distribution of children by gender and school attendance

Variable	Terms and conditions	Workforce	Percentage
Gender of children	Boy	7093	50,8
	Girl	6860	49,2
School registration	Non-registered	4453	31,9
	Registered	9500	68,1
School attendance by gender	Boys enrolled	5058	53,24
	Girls enrolled	4442	46,76

Source: Benin DHS 5, 2017-2018

Table 2: Household characteristics

Variable	Terms and conditions	Workforce	Percentage
Gender of head of household	Male	3895	96,5
	Woman	140	3,5

Type of union	Monogame	2563	64,1
	Polygamist	1435	35,9
Place of residence	Urban	1644	40,7
	Rural	2391	59,3
Household standard of living	Poor	1763	43,7
	medium	736	18,2
	rich	1536	38,1

Source: Benin DHS 5, 2017-2018

Table 3: Distribution of women by socio-economic and demographic characteristics

Variable	Terms and conditions	Workforce	Percentage
Participation in decision making	Decides alone	171	4,2
	Jointly	1893	46,9
	Other	1971	48,8
Woman's level of education	No level	2775	68,8
	Primary	669	16,6
	Secondary or higher	591	14,6
Woman's current occupation	Inactive	645	16,2
	Executive/administration	126	3,2
	Shopkeeper	1280	32,2
	Farmer	1052	26,5
	Worker/service	870	21,9
Age of the woman	15-29 years old	1942	48,1
	30-39 years old	1376	34,1
	40-49 years old	717	17,8

Source: Benin DHS 5, 2017-2018

Table 4: Distribution of women by socio-economic and demographic characteristics

Variable	Terms and conditions	Workforce	Percentage
Decision making	Decides alone	2231	55,3
	Jointly	1744	43,2
	Other	60	1,5
Spouse's level of education	No level	2029	50,3
	Primary	952	23,6
	Secondary or higher	1054	26,1
Spouse's current occupation	Inactive	45	1,1

	Executive/administrati on	478	12,1
	Shopkeeper	319	8,1
	Farmer	2071	52,7
	Worker/service	1017	25,9
Age of the spouse	15-29 years old	875	21,7
	30-39 years old	1478	36,6
	40-49 years old	1130	28
	50-64 years old	552	13,7

Source: Benin DHS 5, 2017-2018

Table 5: Net Effect of Variables on Enrollment of Children Aged 6-11

VARIABLES AND MODALITY	NET EFFECT
PARTICIPATION OF THE WOMAN IN DECISION MAKING (statement from the woman)	***
Only	1,94***
Jointly	1,44***
someone else	Ref
SPOUSE PARTICIPATION IN DECISION-MAKING (declaration from the spouse)	ns
Only	Ref
Jointly	0.84ns
someone else	1.15 ns
RESIDENCE ENVIRONMENT	***
Urban	1.20 ns
Rural	Ref
GENDER OF THE HEAD OF HOUSEHOLD	Ns
Male	Ref
Woman	1,66
Type of union	***
Monogame	Ref
Polygamist	0,76*
LEVEL OF LIVING	***
Poor	Ref
Medium	1,86***
Rich	3,72***
GENDER OF THE CHILD	**
Boy	Ref

Girl	0,81**
WOMAN'S LEVEL OF EDUCATION	***
Without level	Ref
Primary	1,64**
Secondary or higher	2,51***
AGE OF THE WOMAN	***
15-29 years old	Ref
30-39 years old	1,59***
40-49 years old	1,83***
CURRENT OCCUPATION OF THE WOMAN	Ns
Inactive	0,68***
Frame	1.51ns
Merchant	Ref
Farmer	0,65***
Worker	0.88ns
SPOUSE'S LEVEL OF EDUCATION	***
Without level	Ref
Primary	2,61***
Secondary or higher	3,40***
SPOUSE'S AGE	ns
15-29 years old	0.67ns
30-39 years old	Ref
40-49 years old	0.88ns
SPOUSE'S CURRENT OCCUPATION	ns
Inactive	1.18ns
Frame	1.39ns
Merchant	1.35ns
Farmer	Ref
Worker	1.44ns
***=significance at the 1% level, **=significance at the 5% threshold ns=not significant	

Conflict of Interest Statement

The authors state that there is no conflict of interest.

Ethical Approval

The data used for the estimates do not include confidential information about individuals or animals that may raise ethical concerns.

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ABSTRACT

"Improper waste management in the oil and gas sector can lead to environmental damage and potential financial liabilities. This study aims to examine the waste management practices of Schlumberger and Zoil Services Limited in the Western Region of Ghana. The study uses quantitative research and survey design with 83 selected company staff as respondents. Data analysis included frequencies, percentages, means, standard deviation, and an independent samples t-test. The study found that the companies have different facilities to manage waste, but some are obsolete, which cannot ensure effective waste management. The study recommends that the companies invest in modern waste treatment methods, redesign and re-engineer facilities, and train employees to implement new waste management procedures".

Keywords: oil and gas industry hazardous waste sustainability quantitative research survey design western region of ghana.

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Author α: University of Education, Winneba.

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I. INTRODUCTION

Much focus is placed on waste management in Ghana, especially in the urban sectors than the rural sectors. These wastes are sent to a few dumpsites, but, the majority are dumped in drains, streams, and open places. Waste is disposed of by open dumping, open burning, controlled burning and tipping at dumpsites. This has caused a pressing sanitation issue as many towns and cities are overwhelmed with the

management of solid and liquid wastes". this explains the current situation in Ghana and its effect on the economy.

Waste management has been and continues to be a greater problem due to the increasing activities that generate larger volumes of both hazardous and non-hazardous waste. Although the Ghanaian government and other international agencies continue to make conscious efforts to regulate and manage the activities, it has come to a halt since there is not enough sophisticated technology to effectively manage waste generated in offshore and onshore activities in the oil and gas industries.

This phenomenon has rather caused rapid waste management concerns. The oil and gas industries contribute substantially to the growth of every economy. Over the last two decades, waste management practices in Ghana have been an issue that has faced tremendous attention. Waste management is one of the most critical components of oil and gas exploration and production activities and a major concern (Derefaka, 2014; Chen and Lin, 2008; Raj, Prasad, and Bansal, 2006). The conditions of re-use, reduction, recycling, and recovery of waste and non-renewable resources have increased in the last decades, which has prompted governments and agencies to develop policies that could help protect the environment.

The attitudes of multinational companies and individuals' responsibility towards waste management have received several considerations in various jurisdictions including water, hygiene, The attitudes of multinational companies and individuals' responsibility toward waste

management have received several considerations in various jurisdictions including water, hygiene, and sanitation (Manaf, Samah, and Zukki, 2009; Metin and Neyim, 2003; Abdulla, Qdais and Rabi, 2008). Consequently, Derefaka (2014) asserts that the merit of good waste management includes critically managing waste in a way that will not have any negative impact on human health and the environment. Waste generation is part of human and industrial activities and cannot be eliminated. Consequently, the increase in population and advancement in technology has caused the environment to be more contaminated (Lee and Min, 2014).

Management of waste has become a major challenge facing developed countries all over the world which are trying to implement standards to reduce their environmental impacts. It is important to manage waste materials which help create a clean, healthy, and safe environment (Kainth, 2009). Focusing on proper waste management practices will not only get rid of their negative impact but also implement standards and procedures of countries that are well-informed and have had and sanitation (Manaf, Samah, and Zukki, 2009; Metin and Neyim, 2003; Abdulla, Qdais and Rabi, 2008). Consequently, Derefaka (2014) asserts that the merit of good waste management includes critically managing waste in a way that will not have any negative impact on human health and the environment. Waste generation is part of human and industrial activities and cannot be eliminated. Consequently, the increase in population and advancement in technology has caused the environment to be more contaminated (Lee and Min, 2014).

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managing waste (Gabrscek and Isljamovk, 2011). Some developing countries are exploring different and other advanced technologies such as advanced recoveries and recycling of waste (Defra, 2011; Manaf et al., 2009; Metin and Neyim, 2003; Abdulla, Qdais, and Rabi, 2008).

According to Ciocoiu et al., (2016), every country has its ways of managing waste. In advanced countries, several companies have begun to integrate the environment into their work strategies to achieve their environmental and business performance simultaneously. These companies, in turn, increase their profitability, productivity, and performance by cutting down on waste and emissions (Florida and Davison, 2001). Similarly, Zaman and Lehmann (2011) assert that many developed countries are putting in place measures for zero-waste management practices.

The effects of improper management of waste in the oil and gas sector may include the emission of dangerous and poisonous gases into the atmosphere, pollution of water bodies as well as environmental impacts (Gonzalez, 2015). Waste management has been defined as the collection, transport, recovery, and disposal of waste, which includes the supervision of such disposal plans and the after-care of disposal sites, and including actions taken by a dealer who purchases and subsequently sells waste or a broker who acts on behalf of others in arranging recovery or disposal of waste (Gonzalez, 2015). On the other hand, Funmilayo (2014) defined waste management as the collection, transportation, and disposal of garbage sewage, and other waste products.

Even though some developed countries are finding new technologies to improve their waste management practice to a near or if possible zero-waste practice, implementing such waste management practices in a developing country like Ghana is somehow difficult. In developing countries, managing waste is somewhat perceived as solely the responsibility of the government. Meanwhile, budgetary allocation for such projects becomes minimal due to unprecedented corruption and another embezzlement of funds for the management of waste (Ray, Taylor, and Chapman, 2012). Waste generation accompanies

every oil and gas production activity both onshore and offshore. Creating awareness of the importance of the safe management of waste has become very crucial. The Conference Proceedings of UNCED in Rio in 1992 highlighted the challenges regarding sustainable development and environmental protection. These guidelines as prepared by the Oil Industry International Exploration and Production Forum (E&P Forum) and United Nations Environment Programme Industry and Environment Centre (UNEP IE). Waste management programs are now becoming a necessity in the generation and recycling of waste.

Schlumberger Oilfield Services offers an array of services from seismic, deep-water drilling, directional drilling, wellbore productivity tools, engineering services, drilling completion, and workover fluid chemicals, sales, and engineering services, and information technology services, training and after-sales training of advanced technology tools. It also operates in the design formulation and maintenance of complex wells and provides expert services in technical advisory and support throughout the drilling campaign. The corporate headquarters is in Houston, TX with over seventy-five thousand employees worldwide. The company has several departments such as Human resources, legal, operations, and technical support. It is a multinational company with over a hundred branches throughout the world (<http://www.slb.com>). The mission of Schlumberger Limited is to transfer knowledge, technical innovation, and teamwork. Customer focus is their main priority and therefore requires stronger technologies to help overcome the challenges of their customer.

Zoil Services Limited specializes in treating hazardous and non-hazardous waste products from oil and gas exploration activities as well as industrial waste. The company has been certified by the Ghana Environmental Protection Agency (EPA) as capable of treating and managing industrial waste. Zoil has been in operation since February 2009 for such a purpose. Zoil operates an ultra-modern Anaerobic Thermal Desorption Unit (ATDU), an industrial incinerator, and a wastewater treatment system to manage

industrial wastes. Zoil can boast as the only treatment company in Ghana to own an ATDU which began usage in June 2014 and it is currently the only one of its kind operating in Ghana. Zoil's waste treatment facility is in Nyankrom, Shama District, near Takoradi, in the Western Region of Ghana.

The organizational structure of Zoil is made up of Health, Safety, and Environment (HSE), Maintenance, Electrical and Instrumentation, Operations, Process, Human Resources, and Finance departments. These can be attributed to the quality of service they provide for the good environmental impacts of industrial activities. Zoil's vision is to become one of the leading industrial waste management companies in the West African sub-region. They use sound engineering and modern treatment methods to treat hazardous wastes and effluent water streams to standards that fully meet or exceed international standards, (www.zoilservices.org). The operations of these two companies are mainly in the oil and gas sector. Therefore, they need to pay attention to issues such as the management of waste generated for the betterment of their operations and in the interest of the larger society within which they operate.

Empirical evidence supporting waste management practices appears to be overhauling (Defra, 2011; Manaf, et al., 2009; Metin and Neyim, 2003; Abdulla, Qdais, and Rabi, 2008). Studies conducted in various jurisdictions concerning waste management practices include Spain (Mena, Adenso-Diaz, and Yurt, 2011; Rodriguez, Alegre, and Martinez, 2007); the US (Clelland, Dean, and Douglas, 2000; Min and Galle, 2001); Nigeria (Kofoworola, 2007; Nnorom and Osibanjo, 2008); Australia (Zaman, 2014; Berkel, 2007). Various scholars have posited that there has been a tremendous improvement in the recycling and recovery of waste from the environment. However, the management of waste is a major challenge confronting countries putting in much effort to meet international requirements for waste management. According to Deng et al. (2016), every country has a unique approach to managing waste.

Operational activities associated with petroleum products in the oil and gas industry bring adverse impacts to the environment and may result in air pollution, contamination of water bodies, groundwater pollution, shortage of land for waste disposal, and potential financial liabilities. Latif and Iskandar (2019) concluded that due to improper waste management, the conditions worsen which consequently lowers the quality of life of the population. Although waste management is crucial in oil and gas exploration and production activities, it also brings hazards to the environment. (Gonzalez, 2015) asserted that although the treatment of waste is carried out at facilities that are well designed for this purpose, it does not fully protect the environment against the biproducts from these treatment activities. Most oil and gas companies use landfilling to manage waste disposal treatment. However, this waste treatment method has adverse impacts as it may contaminate the groundwater when the waste leaches into the soil. In a study conducted by Funmilayo (2014), it was found that the “sticky” nature of the waste enabled it to accumulate and threaten the environment if it is not managed appropriately and hence the rationale behind this study.

Waste management has become an issue not only in the oil and gas sector of Ghana but also in almost every area of the country. Particularly, there were problems highlighted in the Ghanaian oil and gas industry regarding the improper ways of managing waste. In other words, one notable issue that presents a challenge to the oil and gas industry is how to ensure proper waste management within the sector (Lodungi et al., 2016). It is generally believed that managing waste has been a problem in sectors including the oil and gas sector mainly due to a lack of skilled personnel, lack of proper education in handling waste from energy, and inadequate laws to protect the environment. Other concerns are the deficit in petroleum waste management technology in Ghana, the lack of facilities for managing waste, inadequate facilities, and the cost of petroleum waste treatment. Thus, there are concerns about the management of waste in the oil and gas sector which require further investigations. Against this

background, this study sought to empirically contribute to the efforts in expanding knowledge concerning waste management practices in the oil and gas sector using Schlumberger Oilfield Services and Zoil Services Limited as a case to proffer suggestions for improvement.

The study examined the waste management practices in Schlumberger oilfields and Zoil service limited. In subsequent sections of this paper, the discussion will follow the theoretical and empirical discussions on waste management. This will be followed by the methodology of the study and the results and discussion of field data. The final section is dedicated to conclusions and policy implications.

II. THEORY AND EMPIRICS ON WASTE MANAGEMENT

The passage discusses various theories and concepts related to waste management, environmental economics, and sustainability. Waste management is critical to prevent harm to human health and the environment, and different waste management practices are linked to the type of waste generated and economic considerations. The Waste Management Theory (WMT) is based on the principles of Industrial Ecology aims to prevent harm to human health and the environment, while the environmental economics theory is based on cost-benefit principles and values ecosystems to ensure optimally economic growth while considering the contribution of environmental ecosystems. Sustainability theory assumes that environmental resources are finite and requires three basic competencies to manage resources effectively and efficiently without compromising future needs. The passage also highlights the importance of technological advancements and the role of companies in making cost-benefit decisions about their operations within the larger environmental setup to lessen the adverse impact of their operations on the environment.

Over the years, oil and gas industries review their methods of operations to enable them to cut down on the waste they generate through their activities. Design and re-engineering of storage

capacities for toxic and hazardous waste, improved facilities for technical training and education on treatment procedures as well as investment into skilled and qualified personnel to effectively manage these wastes. These in place have helped manage the waste they generate through their activities.

Waste Management Theory (WMT) has been espoused critically in environmental sciences through engineering design. WMT encapsulates a unified body of knowledge about the waste management system and practices in today's economy. In the oil and gas industry, because of technological advancement and diversification of innovation, conceptual models and other academic theories need to be consolidated for proper integration of waste management practices to be done. It was argued that WMT is developed based on the principles of Industrial Ecology (Derefaka, 2014). The Theory of Waste Management is premised on the fact that waste management should prevent causing harm to human health and the environment, which leads to the conservation of resources (Manaf, Samah, Zukki, 2009). However, industrial ecology successfully combines waste minimization with resource use optimization measures and ensures that resources are effectively circulated within ecosystems. This theory is crucial to this study because waste management aims at preventing causing harm to human health and the environment. Thus, the study will help in bringing out environmental issues into industries' processes and product design.

The environmental economics theory is based on cost-benefit principles. The theory states that there is a depletion of natural resources and ecosystems to achieve economic development (Pearce, 2002). The theory also draws its assumptions from the Pareto principle which suggests that if precise compensation is made to the 'loser' a complete ideal position can be achieved. The key tenet is that it is possible to attain optimal growth through an effective economic system that correctly considers the contribution of environmental ecosystems (Zhiqiang et al., 2001).

It is believed that environmental problems are the result of the failures of the economic system to enhance human well-being (Pearce, 2002). Thus, environmental economics aims to guarantee that ecosystems are valued as vital contributors to overall human well-being as well as economic growth objectives. Ensuring maximum advantages through the optimum use of natural resources is not effective because of the multi-functional contribution of ecosystems. To sustain the environmental economics approach, there is a need for technological advances and progress.

Environmental economics values ecosystems to rebalance the market failures that result in the effects of pollution. A monetary value is placed on ecosystem services mainly to internalize the results of pollution within a cost-benefit analysis (Zhiqiang et al., 2001). Valuation in monetary terms also becomes useful for comparing ecosystem benefits with other economic costs and benefits within the process of environmental impact assessment (Pearce, 2002).

Environmental economists do not share the view of dependability amongst various forms of capital. The theorists view the possibility that natural capital can be substituted and further point to the development of better extraction methods and the finding of other resources which in turn extend the life span of specific finite resources. They also stress the role of technology and human advancement in the efficient use of natural resources (Zhiqiang et al., 2001). Companies including those in the oil and gas sector make cost-benefit decisions about their operations within the larger environmental setup. Their activities largely tend to deplete the environment as a result of the heavy equipment, chemicals, and other harmful substances they use in the course of their operations. They generate so much waste in the course of their activities. Given the importance of their activities to human life, it is logical that measures are put in place to lessen the adverse impact of their operations on the environment. Particularly, since the sustainability of the environment is critical to human life there's a need for these companies to pay attention to the management of the waste they generate. Thus,

this theory is relevant to this study because managing waste is critical in sustaining lives.

The sustainability theory was popularized by World Commission on Environment Development in the 1970s. The theory was founded on the environmental limit theory by economists such as Thomas Malthus and David Ricardo. It assumes that environmental resources are finite and hence the economy must have restrictions. Efforts must be made to use resources effectively and efficiently without compromising on the resources and needs of the future generation (Briassoulis, 2001; Brundtland, 1987). The management of these resources requires three basic key competencies. These are competencies competence, technical competence, and context and dual competence (Beata et al., 2014).

The sustainability theory also talks about equal treatment for both humans and social and natural resources. This is because these resources are very crucial to both human and organizational development (Briassoulis, 2001; Commission of the European Communities [CEC], 2013). The efficient and effective use of social, human, and natural resources provides long-term developmental outputs at both national and organizational levels. The theory is vital to this study because companies including oil and gas companies need to institute measures to sustain the environment for the greater good of themselves and the world, at large. One notable way to achieve this is to properly come out with mechanisms to manage the various kinds of waste they generate in the course of their operations. The waste generated will eventually destroy the environment if no measures exist to effectively manage them.

In Ghana, there have been instances where there have been various degrees of spills and outbreaks have occurred due to weak observance of waste management protocols. This has resulted in the loss of lives and properties (Raj. Prasad and Bansal, 2006; Hossain, Santhanam, and Norulaini, 2011). This outcome has forced various legislations to enact laws and directives to control and further reduce incidents. Good waste management techniques will help mitigate bad

outcomes from improper waste management activities. Waste generated from other countries cannot be further broken down into other useful substances due to their dangerous nature and must therefore be used only for landfilling and incineration (Chen and Lin, 2008). In certain countries like the Niger Delta, several treatment facilities available are obsolete because most of their equipment has been used for several years which has caused them to deteriorate because it has exceeded the life span. (Ibem-Ezera, 2010). This is because pipes that have operated above the installed capacity should therefore not be in use as it may lead to ruptures and explosions, and so waste will be created.

According to Zhao (2017), one of the factors leading to improper policy enforcement in waste management in the Ghanaian economy is due to inadequate facilities and funds to handle its treatment. The oil and gas industry in Takoradi suffers from the unavailability of waste treatment facility constitutes a serious dilemma in the management of waste streams (Derefaka, 2014). It has been noticed that Ghanaian waste management adopted the use of host community contractors to enhance local content, but there are issues the compliance with standards. Facilities that can accommodate waste for further innovation are underestimated in the Secondi/Takoradi constituency.

According to the United States Environmental Protection Agency (2002) website, environmental education (EE) has been defined as the means of making individuals understand and have an awareness of the need to protect their environment and further make recommendations on ways to conserve it. Effective implementation of such education will further help raise awareness among the residents of the country about how important it is to conserve the environment. It will trigger them to take action and be more responsible toward the environment. EE is crucial for the management of waste disposal, especially in the oil and gas industry which contributes to major pollution to the world at large and thus lowers the quality of life. Mwiinga (2014) revealed that controlling activities that result in a high generation of waste

will further help reduce waste accumulation. These phenomena could be achieved through EE. Creating environmental awareness of accidental discharge on our water bodies as well as the environment is important from a global perspective of resource management (Agunwamba, 1998). In Zambia, a study by Sichaaza (2009) found that waste was found all over public places due to a lack of knowledge and negative attitudes towards waste management. They possessed negative attitudes because they lack education on the subject matter (Mwiinga, 2014). Notwithstanding the countries, Ghana on the other hand has requisite technologies that can turn waste into valuable assets. However, experts who can help manage waste are inadequate in Ghanaian society.

Lodungi (2014) found that managing the waste produced must follow guidelines such as Petroleum Development Act 1974, Petroleum Regulation 1974, Gas Supply Act 1993, and Environmental Quality Act 1974. Also, Ugochukwu (2008) and UNDP (2006) observed that factors contributing to issues of environmental concerns in Nigeria are the lack of strict measures by law enforcement agencies. Inability to demarcate substantial lands for industrial use from domestic use. This enables industries that generate high levels of waste to pollute communities that are cited closely to these sites and hence are exposed to these detrimental conditions. Where there is an absolute absence of laws, waste production in the oil and gas industry may be on the rise. Failure on the part of the Government brings about weak systems which leads to failure to implement good policies. (Ibem-Ezera, 2010).

Developing countries like Ghana have weak financial muscles like the Philippines, Malaysia, Thailand, and Sri Lanka, which equally lack the capital to procure expensive technologies for solid waste management (Zhao, 2017). Scholars have further stated that technologies successfully used in developed countries may only result in a greater debt in developing countries instead of a solution. The Philippines for instance is a low-middle-income developing country. A lack of capital can be a barrier to applying

waste-to-energy (WtE) technologies (Zhao, 2017). Thus, waste management with proper techniques is needed for those countries. As a result, Ghana can however turn things around to recycle the waste into energy.

III. CONCEPTUAL FRAMEWORK

Drawing on the theoretical and empirical perspectives of waste management, this work presents a conceptual framework for the challenges that hinder waste management. A conceptual framework displays the complete research by classifying and stressing the elements, patterns, and relationships that exist between and among the study concepts (Kalaba, 2014). The conceptual framework of this study shows that the indicators of waste management practices have a significant impact on waste management in the oil and gas industry located in Takoradi. It also argues that all the dimensions have some level of impact on waste management. Figure 2.1 highlights three main issues that the oil and gas industry is faced with.

From the framework, it is lucid that to effectively manage waste there is the need to first know the types of waste generated. This is very much the case because various forms of waste are generated by various persons and entities. Thus, in managing waste it is very important for managers to first identify the types of waste generated to understand the best strategies to adopt. To this end, oil companies are required to know the types of waste they generate to be successful at managing them.

Moreover, after identifying the types of waste generated, stakeholders must develop strategies and methods to help effectively manage waste.

Closely following the methods is the investment in facilities. Facilities are very essential in successful waste management efforts. When facilities such as Anaerobic thermal desorption units (ATDU), wastewater treatment plants, air service facilities, port facilities, and hazardous waste treatment facilities are available, it promotes the management of waste. It should also be added that the type of facilities to invest in will depend,

among others, on the types of waste generated and the capacity of the managers. It should also be stressed that the oil and gas industries generate dangerous waste from their activities both offshore and onshore which needs special facilities to manage them.

Certain wastes generated from their activities like hydrocarbons, drill waste, cuttings from wells, and other seismic explosive activities need more advanced treatment facilities to prevent these wastes from being disposed of wrongfully and unlawfully into water bodies as well as the environment affect both plant and aquatic life. Thus, Figure 1 is premised on the conviction that with an awareness of the types of waste generated by oil companies, appropriate waste management methods coupled with the required facilities, oil companies can effectively manage waste for the accomplishment of their goal.

IV. METHODOLOGY

The study population consisted of 105 employees from two companies, Schlumberger Oilfield Services and Zoil Services Limited, both located in Takoradi. The sample size for the analysis was determined using Morgan and Krejcie's table for sample size determination, and a sample size of 83 was used.

Purposive sampling was used to target employees who are directly involved with the waste management operation of the two companies, and a simple random selection was used to gather accurate first-hand information and a general overview of the waste management and treatment techniques of the companies. The sample size was made up of employees who are engineers, technicians, health, and safety as well as operators who are directly involved with the waste management procedures. A total of 83 structured questionnaires were administered to all employees in the sample, with 40 from Schlumberger Oilfield Services and 43 from Zoil Services Limited. All questionnaires were retrieved, ensuring that the analysis is a true representation of what is on the ground. The data was analyzed using frequencies, percentages,

means, standard deviation, and an independent samples t-test.

V. RESULTS AND DISCUSSION

Introduction

This chapter outlines the analysis of the data that was collected for the study. Questionnaires were self-administered to employees of selected staff of Schlumberger Base inside Takoradi Port and Zoil Ghana Limited at Inchaban in the Western Region of Ghana. These selected staffs have in-depth knowledge of waste management. This phase also represents the analysis based on the objectives set for this research in chapter one. The chapter however first starts with the demographic backgrounds of respondents in the study.

VI. BACKGROUND CHARACTERISTICS

The background features considered in this study are sex composition, marital status, age, educational background, level of income, and nationality. A total of 83 questionnaires were administered to the field personnel for both Schlumberger Oilfield Services and Zoil Services Limited of which all 83 questionnaires were retrieved from the respondents.

The total response obtained about the sex of respondents of the study indicated that 67 of the respondents representing 80.7% were males whereas 16 of the respondents representing 19.3% were females. From the analysis, it can be concluded that the majority (80.7%) of the respondents were males. It is fair to indicate that the nature of the job does not favor most women as it is very difficult with the use of various chemicals. Generally, many women will not like to be exposed to such environments.

Education is key. It gives knowledge to people. However, it was recorded that a total of 47% of respondents were Degree holders, followed by 44.6% of respondents who had master's degrees. Finally, 8.4% of respondents were diploma holders. This indicates that the educational level of many of the respondents was generally high. The respondents are also knowledgeable in managing waste. It also gives the view that

training a highly skilled and efficient workforce in managing waste is very possible considering their educational background.

Moreover, 89.2% of respondents were all Ghanaians. A total of 10.8% of respondents were non-Ghanaians. This indicates that both Schlumberger Oilfield Services and Zoil Services Limited are made up of multinationals and professionals from different countries who will bring expertise and technical know-how to the waste management process. This is likely to allow for knowledge transfer from the different and experienced workforce who will bring on board different waste management approaches. Ghanaians can then learn from them to improve their waste management processes.

VII. RESOURCE FROM WASTE GENERATION

It can be observed from Table 1. that we can generate resources from waste if it is managed well. These resources could be a result of recycling, rubber production, fertilizer, and landfills to talk about a few. From Table 4.6 it could be seen that seventy-eight (78) respondents out of 83 said yes, we generate resources from waste representing 94% whilst five (5) out of the 83 respondents representing 6% said no, resources cannot be generated from waste. However of the view that most of the respondents believe that with the right equipment and technical know-how, we can generate a lot of resources from industrial waste.

Table 1: Resource from waste generation

Response	Frequency	Percent
Yes	78	94.0
No	5	6.0
Total	83	100.0

Source: Field Data, 2020

VIII. HOW LONG HAVE YOU MANAGED WASTE IN THE COMPANY

From Table 2. the analysis indicates how long waste has been managed in Schlumberger and Zoil Services Limited. Out of a total of 83 questionnaires that were administered, sixty-seven (67) of them represent 80.7% which is most respondents have had more than five (5) years of experience in managing waste in the company. Eleven (11) respondents representing 13.3% have also had three (3) years of experience

in managing waste. A total of two (2) respondents representing 2.4% have also had two (2) years of experience in managing waste whereas a total of three (3) respondents representing 3.6% have also had one (1) year of experience in managing waste. From the data, it is however evident that a greater percentage of the respondents have been able to manage waste for more than five (years). This shows clearly that most of the respondents have had enough experience, adequate know-how, training, competence, and exposure to managing waste.

Table 2: How long respondents have managed waste in their company

Response	Frequency	Percent
1 Year	3	3.6
2 Years	2	2.4
3 Years	11	13.3
Above 5 Years	67	80.7
Total	83	100.0

Source: Field Data, 2020

IX. EXPLORING THE TYPES OF WASTE GENERATED IN THE OIL AND GAS INDUSTRY

The first objective of this research was to ascertain the types of waste generated in the oil and gas industries in Ghana. Feedback from respondents was obtained and presented in Table 4.12. In analyzing data obtained for this objective, a scale of 4 to 1 was used; 4 representing Strongly Agreed (SA), 3 representing Agree (A), 2 representing Disagree (D), and 1 representing Strongly Disagree (SD). Concerning the generation of hydrocarbon waste from oil and gas production in

the companies, the study revealed that such waste was generated by them as confirmed by a mean score of 2.600 and a standard deviation of 1.13. The analysis also revealed and agreed that used containers and oily rags are the main types of waste generated with a mean of 3.60 and SD of 0.65. The respondents also agreed that sludge and wastewater with a mean of 3.27 and SD of 0.80 is another major waste generated by the companies. Respondents however disagreed that ballast water and waste from explosive activities with means of 2.01 and 2.00 and SD of 1.03 and 1.02 respectively were not generated by the activities of these companies.

Table 3: Types of waste generated in the oil and gas industry

Type of waste	Mean	Std. deviation
Hydrocarbon waste from oil and gas production	2.600	1.13735
Expired chemicals for drilling activities	2.3735	1.23674
Hazardous chemicals from Tank cleaning activities	2.500	1.16176
Ballast water	2.0120	1.02997
Used containers and oily rags	3.600	.64756
Sludge and wastewater	3.2771	.80112
Waste from explosive activities	2.00	1.02137
Average responses	2.6000	1.00512

(Source: Field Data, 2020)

X. EXPLORING THE METHODS USED BY THE COMPANIES IN MANAGING WASTE GENERATED

The second objective of the research was to explore the methods used by the companies in managing waste generated; Views from respondents were obtained and presented in Table 4.10. with the keys provided below:

- 4=Strongly agree (SA)
- 3=Agree (A)
- 2=Disagree (D)
- 1=Strongly Disagree (SD)

It is evident from the analysis that some advanced treatment methods in managing waste presently

such as disposal into salt caverns with a mean of 1.79 and a standard deviation of 0.91 and bioremediation with the use of bacteria (M=2.06, SD=1.11) are not practiced. However, from the respondents, landfilling and compaction /shredding with the highest means of 3.22 and 3.20 with standard deviations of 0.86 and 0.87 respectively are what is mostly practiced in both companies. The issue of whether the companies can convert their treated waste into useful energy came out from the respondents that a mean of 2.12 with an SD of 1.16 affirmed that both companies either lack the facilities or the technology to implement this waste treatment method.

Table 4: Methods used by the companies in managing waste generated

Method	Mean	Std. Deviation
Landfilling	3.2169	.85609
Oil-water separation technology	3.1205	.87510
Disposal into salt caverns	1.7952	.90741
Advance thermal treatments	3.0843	1.01459
Bio-remediation with the use of bacteria	2.0642	1.10817
Compaction/shredding	3.2048	.87196
Incineration	3.1446	.92568
Waste to Energy	2.1205	1.16239
Average responses	2.7188	0.96517

(Source: Field Data, 2020)

This, however, gingered Latif and Iskandar (2019, pg. 135) to posit that “education is fundamental to develop responsibility and awareness. Landfilled putrescible waste cause gas and leachate production. In Europe, the EU Directive 1999/31/EC on the landfill of waste has stimulated the diversion of organic matter to composting or specialized landfill sites, especially in the Netherlands, Sweden, Denmark, and Austria. Landfilling remains the most prevalent waste treatment and disposal method despite carrying the greatest threat to human health in addition to its proven negative impact on the environment. The form of landfill operations implemented in Ghana is often un-engineered open pit waste dumping with no leachate control, scant application of cover material, and open access to scavenging animals, rodents, and other diseases vectors (Tenkorang, Yeboah-Agyepong, Buamah, Agbo, Chaudhry and Murray, 2012).

XI. VIEWS OF EMPLOYEES ON THE EXISTING FACILITIES FOR WASTE MANAGEMENT IN THE COMPANIES

The third objective was to examine the views of employees on the existing facilities for waste management in the companies. Means and standard deviation were used for analyzing the data generated and the results are shown in Table 4.11. On the issue of whether facilities help in the storage of toxic and hazardous substances, the respondents moderately agreed that facilities helped in that regard based on a mean score of 3.50 and a standard deviation of 0.78. In effect, the study showed that the two companies had facilities that helped in storing toxic and hazardous substances. This result contradicts that of Ibem-Ezera (2010). In a study done by the author in Niger Delta, it was found that many of the facilities for the management of waste are obsolete.

Table 5: Views of employees on the existing facilities for managing waste

Role facilities play in the management of waste	Mean	Std. Deviation
Facilities help in the storage of toxic and hazardous substances	3.5060	.78668
Facilities are critical in the processing of toxic and hazardous waste	3.2530	.90854
Facilities are critical in the final disposal of toxic and hazardous waste	3.1807	.87156
Facilities help in the treatment and final disposal of domestic wastewater	3.3373	.80056

Facilities are used for the recovery and disposal of radioactive waste	2.3133	1.14687
Facilities are relevant in the recycling of waste materials	2.9759	.71527
Average responses	3.0943	0.87158

(Source: Field Data, 2020)

Concerning whether the companies had facilities for processing toxic and hazardous waste, the researcher observed that indeed the two companies had those facilities which helped in achieving (M=3.25, SD=0.90). This is supported by a mean score of 3.25 and the corresponding standard deviation of respondents was obtained and presented in Table 4.11. In Ghana, several serious and highly publicized pollution incidents associated with incorrect waste management practices led to public concern about the lack of controls, inadequate legislation, and environmental and human health impact (Raj. Prasad and Bansal, 2006; Hossain, Santhanam, and Norulaini, 2011).

Furthermore, the findings of the study are in line with the sustainability theory which calls for the need to put in place measures to sustain the environment for human well-being. Implicit in the theory is the need for companies to effectively manage the waste they generate (Briassoulis, 2001). Thus, the measures these two Companies have put in place to manage waste help to reinforce the practical relevance of the theory.

The second part of the third objective was to determine the adequacy of this existing facility in

managing waste in the companies. Views of respondents were obtained and detailed in Table 4.12 with the key's bel

- 4=Very Adequate (VA)
- 3=Moderately Adequate (MA)
- 2=Lowly Adequate(LA)
- 1=Inadequate (IA)

From Table 5, it can be seen that the companies have very strong facilities for the storage of toxic and hazardous substances with a mean of 3.35 and SD of 0.74 which indicates the companies have control of toxic and hazardous waste within their facilities and this prevents the release of these substances into the environment which is very harmful to human life as well as the environment. The companies also have very reliable facilities for processing toxic and hazardous waste with a mean of 3.02 and an SD of 0.91 which implies all toxic and hazardous wastes are well processed and managed in the companies. Also, facilities for ensuring the final disposal of toxic and hazardous waste with a mean of 2.88 and SD of 0.72 is very adequate from the respondent's point of view.

Table 6: Views on the level of adequacy of existing facilities for managing waste

Adequacy of the existing facilities in managing waste	Mean	Std. Deviation
Facilities for the storage of toxic and hazardous substances	3.3494	.73971
Facilities for processing toxic and hazardous waste	3.0241	.91032
Facilities for ensuring the final disposal of toxic and hazardous waste	2.8795	.72242
Facilities for the treatment and final disposal of domestic wastewater	3.1084	.88362
Facilities for recovery and disposal of radioactive waste	2.2169	1.10485
Facilities used in the recovery of waste materials	2.7590	.89156
Average responses	2.88955	0.88268

(Source: Field Data, 2020)

However, the respondents disagreed with the adequacy of the facilities for the recovery and disposal of radioactive wastes with a mean of 2.22 and SD of 1.10. Companies that are well-established build their facilities the enablement of efficient production and profitability. In Malaysia, in terms of facilities, “authorized companies which have a license that meets the standard requirement should handle the location for waste disposal. The standards in waste management for the oil and gas industry are already very high and are currently being implemented. Somehow facilities need to be enhanced as they are as important as the issue itself” (Latif and Iskandar, 2019). On the other hand, Ghana has generated enough funds from philanthropists in curbing the issues of waste. Environmental education on the other hand probes adequate attention to resolving waste issues. Basic education is needed in the life of every individual to help manage and eradicate waste for proper sanitation to prevail. Technology helps in advancing phenomena. The results of this study are in agreement with the

environmental economics theory which sees technology and human advancement as essential in the management of the environment (Zhiqiang et al., 2001).

XII. WHETHER OR NOT DIFFERENCES EXIST IN THE VIEWS OF EMPLOYEES OF THE TWO COMPANIES CONCERNING THE ADEQUACY OF EXISTING FACILITIES FOR MANAGING WASTE

The fourth objective of this research was to examine whether or not there exist the views of employees of the two companies concerning the adequacy of the existing facilities for waste management waste. Independent samples t-test was conducted to compare the means of the two companies on the adequacy of facilities their companies have. Results from the analysis have been displayed in Tables 5 and 6.

Table 7: Group statistics

Differences in the adequacy of facilities	N	Mean	Std. Deviation	Std. Error mean
Schlumberger Oilfield services	40	47.36	0.744	3.145
Zoil services limited	43	32.11	0.641	2.481

(Source: Field Data, 2020)

Table 8: Independence samples t-test of the difference in the views of employees of the two companies concerning the adequacy of existing facilities for managing waste

	F	Sig	t	Df	Sig(2-tailed)	Mean difference	Std Error difference
Equal variances assumed	2.400	0.131	-3.142	8.000	0.214	-0.875	1.876
Equal variances not assumed			-3.712	7.000	0.162	-0.875	3.545

(Source: Field Data, 2020)

The first indicator to look out for is the mean values in the group statistics. Here it can be seen that on average Zoil services Limited has more

facilities for managing waste than Schlumberger oilfield services (47.36 as against 32.11). Further, in determining whether the difference between

them is huge enough the independence samples t-test was conducted. SPSS reported a t-value of -3.142 and a 2-tailed p-value of 0.2 which is very significant to our study. The p-value of 0.2 is greater than the alpha value of 0.05. This shows that no differences exist in the views of respondents on the adequacy of facilities in the two companies. This analysis agrees with the null hypothesis that there is no difference between the variance of the two facilities.

XIII. CONCLUSIONS AND POLICY IMPLICATIONS

From the study, it is clear that different types of hazardous waste are being generated by oil and gas companies. These wastes could potentially negatively impact the environment if not well managed. Regarding methods of managing waste, it can be concluded that several methods are in place to effectively manage the waste generated by the activities of these companies. However, it is important to note that other waste management technologies should be adopted to effectively manage these wastes. A skilled and experienced workforce is required to implement these waste management technologies.

Concerning the existing facilities and the accuracy of these facilities, the researchers concluded that indeed the companies have different facilities to manage their wastes. However, some of the facilities were obsolete and so the companies need modern facilities that can effectively manage the generated waste. No differences exist in the views of respondents of the two companies in terms of adequacy of facilities though the activities of Schlumberger are somewhat different from that of Zoil from that of Schlumberger. These wastes are gathered and sent to Zoil for the actual waste treatment to take place. Thus, it is clear that Zoil will have good facilities for managing waste because its actual mode of operation is waste management. In general, waste has been effectively managed in these two companies. Some of the obsolete facilities need critical attention. It is important to train the employees to give them more insight into their core mandate to effectively manage their waste.

Based on the key findings and conclusions, it is recommended that the management of the two companies should train and retrain employees on their mode of operation and put other waste treatment methods from other countries. Training gives more understanding of the key processes and better implementation. In addition, the management of the two companies should invest in the maintenance, re-design, and re-engineering of their facilities to fit modern waste treatment methods and procedures. This will help reduce the exposure of this toxic and hazardous waste to the environment. Again, management should ensure there is the revision of procedures to enable the companies to the current and modern waste management procedures. The revision will also get rid of non-production time as well as waste in the system for effective implementation. Finally, the companies should adopt current waste treatment methods like bioremediation with the use of bacteria which employs bacteria to eat up all the solid waste generated over some time. Energy waste is also a very good way of managing waste which converts waste into more useful energy for income generation.

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Studies of farmer-managed irrigation systems in Nepal in the 1980s documented the potential of farmers to use sophisticated technical and organizational practices to manage water. In the 40 years since the first studies, population growth, migration, urbanization, new transport networks, and technological change have brought dramatic change in rural communities. This paper reports on the functioning of six irrigation systems in the wake of these changes, based on a series of studies over the years, including a revisit to these systems in 2022.

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Adaptation to Change in Six Farmer-Managed Irrigation Systems in Nepal: Forty Years of Observations

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Studies of farmer-managed irrigation systems in Nepal in the 1980s documented the potential of farmers to use sophisticated technical and organizational practices to manage water. In the 40 years since the first studies, population growth, migration, urbanization, new transport networks, and technological change have brought dramatic change in rural communities. This paper reports on the functioning of six irrigation systems in the wake of these changes, based on a series of studies over the years, including a revisit to these systems in 2022.

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I. INTRODUCTION

Studies of irrigation have established that there are many long-enduring farmer-managed irrigation systems (FMIS), some of which are centuries old. In some cases these were built by the State or external benefactors; in other cases by the farmers themselves, but the defining characteristic of FMIS is that the irrigators have primary decision-making authority and responsibility for operation and maintenance of their systems. In the 1980s, detailed studies of FMIS in Nepal by Robert Yoder, Edward Martin and Prachanda Pradhan¹ challenged the prevalent notions that irrigation required substantial centralized control [Wittfogel 1957]. Their studies of hill irrigation systems in the villages of Argali and Chherlung of Palpa District and the Chhattis Mauja system of Butwal, in the terai (lowlands) Rupandehi District² demonstrated a wide range of local innovations in developing and managing irrigation systems with sophisticated hydrologic knowledge and management practices.

These were key studies in shaping understanding of the potential for self-governance of irrigation systems, such as Elinor Ostrom's [1990] *Governing the Commons*. The diversity of water rights systems that farmers had developed, and how water rights were linked to past investments and ongoing responsibilities laid the foundation for understanding of hydraulic property [Coward 1986]. But few studies have examined how FMIS have persisted in the face of contemporary transformations of rural society [Bastakoti et al. 2010]. In the four decades since the first studies of these systems in Nepal, there have been profound demographic, economic and technological changes in rural Nepal. How have these forces affected the irrigation, and how have these systems adapted?

This paper presents a unique combination of first-hand observations by researchers who have studied these systems repeatedly over forty years, along with a review of other studies, to identify how they have adapted in response to key changes, particularly urbanization, migration, changing gender roles, and technological change.

We begin with a brief description of our six case study sites and our methods. We then provide a broad history of the evolution of the systems and their water rights, followed by observations on

¹ Robert Yoder, an irrigation engineer and Ed Martin, an agricultural economist, spent 18 months studying the socio-institutional and physical aspects that have enabled irrigation success, as part of their Ph.D. dissertations in Cornell University.

² In the early 1980s, Prachanda Pradhan studied the organization and institutions used by the Chhattis Mauja farmers to manage a much larger *terai* system.

how urbanization, migration, physical infrastructure, markets and technological changes have affected them.

II. STUDY SITES

All our case studies are of surface irrigation systems diverting water from a river or stream, with open canals to bring water—often over long distances—to the command area.

In Argali, the Raj (royal) Kulo (canal) of 48 ha command area was constructed under the patronage of King Mani Mukunda Sen of Palpa about 400 years ago. This system is situated on a river terrace of the Kali Gandaki River. Argali's irrigation water is diverted from the Kurung stream and conveyed by canal to the command area. In several sections there are short stretches of tunnel to avoid the difficult, unstable slopes of the hill. [Yoder 1986; Martin 1986].

The Chherlung Irrigation systems were constructed in the 1930s and are called Thulo (large) Kulo of 40 ha command area and Tallo (lower, relative to intake) Kulo of 46 ha command area. Their source of water is the Bargandi stream. Both canals were constructed a few years apart, serving different command areas. Construction was undertaken by different ethnic groups of Chherlung village. They represent innovative construction management, water rights, water allocation and water distribution methods [Yoder 1986; Martin 1986; Pradhan 2010].

The Chhattis Mauja (“36 Villages”) irrigation system is about 170 years old with a command area of over 3500 ha, one of the largest farmer-built and managed systems in Nepal. It diverts water from the Tinau River in the city of Butwal into the gently sloping land of the terai. The Tinau River is a calm stream in the dry season but often floods during the monsoon, requiring frequent canal intake maintenance during paddy cultivation season. The Chhattis Mauja system was constructed by households in Kumari village; the canal was built through the forested jungle to their village. As new settlers, mostly from hill areas of Nepal, moved in and removed the forest, Kumari village became the tail end of the system. When the research on this system began in the

early 1980s, there was an elaborate four-tier organizational hierarchy to manage canal maintenance [Pradhan 1983; 2012]. A more detailed study of the system was carried out by the International Water Management Institute (IWMI) in the late 1980s that included measurement of how accurately the allocated shares of available water were delivered to each village unit [Yoder 1994].

The Andhi Khola Project was conceived as a hydropower project designed to feed into the national grid. When it was proposed for funding, donors indicated that they would not be interested in the project unless the local community also directly benefits [Liechty 2022]. As a result, the hydropower project was revised to include a community development component with an agreement that some percentage of the water diverted to the project would be reserved for hydropower and community development that made irrigation became the primary community activity. Robert Yoder, Ed Martin and Prachanda Pradhan were invited by the United Mission in Nepal to provide suggestions for the design of the irrigation system that would ensure that the largest possible number of project-affected households would benefit [Pradhan 1985; Van Etten et al. 2002].¹

The Kallaritar Irrigation System of 120 ha. in Dhading district was constructed by the government with fund provided by Asian Development Bank in the late 1980s, with management responsibility given to the water users' association (WUA). It has an 11 km long canal from the intake to the command area. The command area has three sections, called: Ghartitar, Phosretar, and Kallaritar. A specified length of the main canal is allocated to each section for maintenance. Each section decides its own mechanism for allocating labor for its share of the maintenance [Brabben 2004; Pradhan et al. 2015]. A third party is hired to distribute the irrigation water during the paddy season, to match the established water allocation allotment for each farmer's field.

¹ Ornella, Sissa Jupiate, 2019, Male Migration and Feminization in Nepal: Bane or Boon. MSc. Thesis, Utrecht, Utrecht University

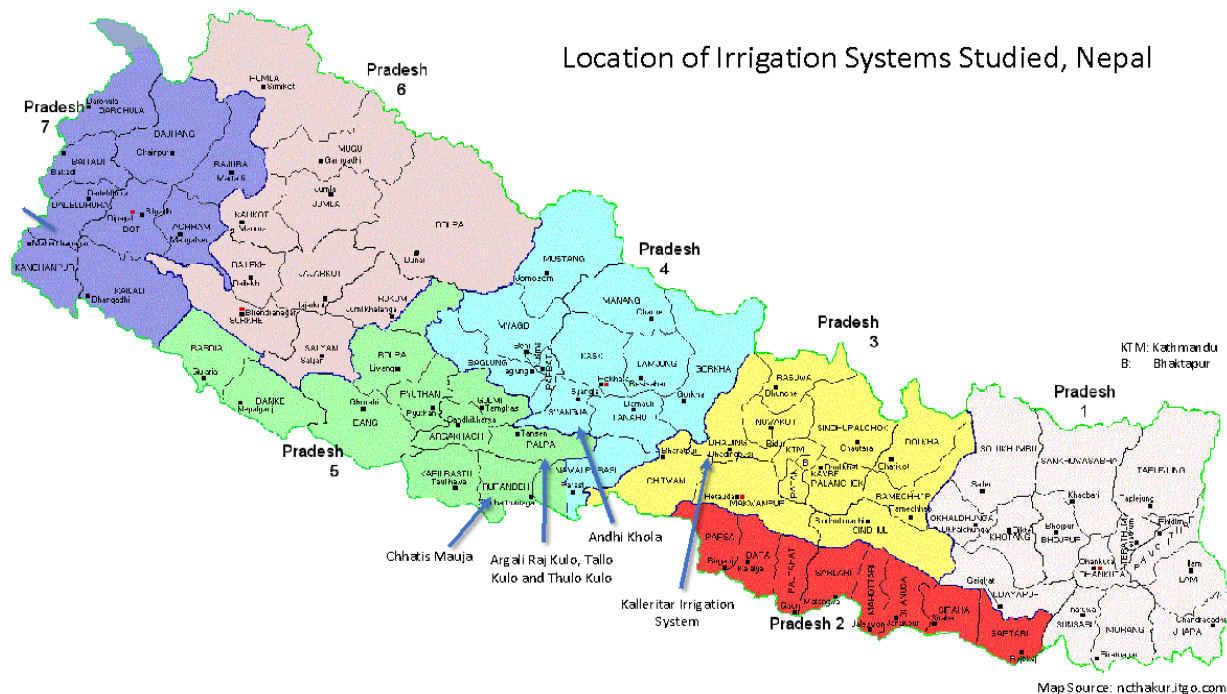


Figure 1: Location map of the systems

Table 1: Key features of case study irrigation systems

System Name	Argeli Raj Kulo	Chherlung Thulo Kulo and Tallo Kulo	Chhatis Mauja	Andhi Khola	Kallaritar
District	Palpa	Palpa	Rupandehi	Syangja	Dhadang
Hill or Terai	Hill	Hill	Terai (plains)	Hill	Hill
(Approximate) age	400 years	90 years	170 years	24 years	35 years
Constructed by	King	Farmers	Farmers	Development project	Government and ADB
Command area	48 ha during paddy season; almost twice as much in winter	Thulo Kulo 40 ha Tallo Kulo 46 ha	>3500 ha	280 ha	120 ha

Water rights	Primary (Barkhe) and secondary (Heude) water rights	Tradable shares based on original cash and labor investment	Based on shares each village holds, Labor contribution based on water share	Shares based on original labor investment	Shares proportional to land
Notable features	Self-managed system, linked with highway	Self-managed system, linked with highway	Built by and serves 36 (now 58) villages; major urbanization of Butwal	Nexus arrangement between hydropower and irrigation project	WUA allocates water and appoints separate group for water distribution

III. METHODS

Though the study of these systems started over forty years ago, the researchers continued to periodically visit and observe adaptation and changes. In 1994, IWMI published a study of Chhattis Mauja system [Yoder 1994]. In 2006, Pradhan, Yoder and Martin visited the Argali and Chherlung systems to compare the cropping pattern and yields between the 1980s and 2006 [Pradhan et al. 2007]. Similarly, Pradhan studied the community mill established in Thulo Kulo in Chherlung [Pradhan 2010]. Argali, Chhattis Mauja and Kalleritar irrigation systems included in two rounds of study (in 2010 and 2019) on changing women’s roles in irrigation governance due to male out-migration and the impact of mechanization on agriculture activities [Pradhan et al. 2015; Meinzen-Dick et al. 2022]. The Andhi Khola system was studied under Pradhan’s supervision by numerous M.Sc. and Ph.D. students. In late 2020, the International Center for Integrated Mountain Development (ICIMOD) sponsored a study of the hydropower and irrigation trade-off in the Andhi Khola project [Pradhan et al. 2018]. All these studies used a mixture of different methodologies, including qualitative interviews, in-person and telephone surveys, participant observation and hydrologic measurements. We draw on all these previous studies plus a revisit to all six systems in March 2022, when three of the coauthors of this study were able to meet with leaders of the systems and others whom they had known from previous

studies and carry out direct observations of portions of the irrigation infrastructure.

We consider irrigation systems as socio-ecological systems (SEs) composed of biophysical and social components where individuals have self-consciously invested time and effort in developing an institutional infrastructure, and, in some cases, such as irrigation systems, are also physical infrastructures [Ostrom 2009].

Irrigation systems have multiple dimensions in their operations, and they change roles and functions over time in response to internal and external influences [Aubriot 2022]. Observations over the 40-year timespan have enabled a qualitative analysis of their adaptation to socio-ecological changes.

IV. EVOLUTION AND ADAPTATION OF WATER USERS’ ASSOCIATIONS

Irrigation development in Nepal has traditionally been the community’s responsibility. An edict issued by king Ram Saha (1666-1693) states:

...let the local water conflict issues be settled at the community level [Riccardi 1977].

Similarly, the National Statute of 1854, promulgated by Jung Bahadur, stated that irrigation systems can be constructed by the people, and no one is allowed to construct above an existing canal in any way that would disturb the water supply to the existing one.

The 1992 Water Resources Act declared that water is national property, a major change from previous laws and customs. Anyone wishing to access water requires a license from the government, which allows for private investment in irrigation development. The 1992 Act, however, also provides that customary law and practices will not be disturbed by the Water Resources Act. Hence, existing water rights in FMIS have continued, with one exception: the Act set out the order of priority, with drinking water as the highest priority. Due to population growth, the demand for drinking water has increased.

The World Bank made it a condition for a 1989 Irrigation Line of Credit that a WUA be formed before assistance is provided to an irrigation system, whether farmer-managed or government-managed. The Nepal government agreed to help form WUAs and register them under the 1975 Association Act. The 1992 Water Resources Act provided that irrigators' water right be registered in the District Water Resources Committee. This was made mandatory for all irrigation systems seeking financial assistance from a donor or from the government. The 2008 Irrigation Regulation and subsequent amendments allowed Irrigation Department and Cooperative Department to register WUAs.

Both Argali and Chherlung irrigation systems have had some form of WUA throughout their existence. In local terms, the committee responsible for irrigation management is called the "Kule Bhai" (community of irrigators). The Kule Bhai, like a family, need to manage the affairs of the irrigators to ensure that maintenance is carried out and water is delivered properly to the entire user group. In both, this traditional WUA continues to oversee operation and maintenance. The old terms are still used, and old practices still followed, such as Mukhiya and Baidar. The Mukhiya is the head of the irrigation system and makes decisions for the management of the Argali Irrigation System. The Baidar is the record keeper who keeps records on land and labor contributions from each landholder at the annual canal maintenance. A similar term is used for irrigation officials in Chherlung Thulo and Tallo Irrigation systems.

The Argali system has an annual meeting of irrigators on the first day of Jestha (the Nepali month that falls in May\June) where major management decisions are made, including the selection or continuation of irrigation officials like the Mukhiya and Baidar. With the requirement to register WUAs, new terms like Chairman, Secretary and Treasurer are also used. It is compulsory for the members to be present at the Jestha (May-June) meeting.

After the Raj Kulo physical systems in Argali and the Chherlung systems were strengthened through successive investments, some new practices emerged, and some old practices were abandoned. Some routine practices, such as daily patrols of the canal to correct minor problems in both Argali and Chherlung, have been abandoned because the structures are now strong and stable.

There is very little leakage, so daily patrolling of canals is unnecessary. Traditionally, women were not allowed to participate in the maintenance of the system in Argali; now, they are allowed to participate. In both Argali and Chherlung, over a third of the irrigation system Executive Committee members are women.

Both systems have defined irrigation water as community property. Membership of the community is defined by the investment during construction of the systems. This implies that all water related activities are to be decided collectively. Benefits and costs are shared collectively.

The Andhi Khola WUA was established under the Association Act in 1984. It was the first WUA registered at the Chief District Office of Syangja. Its management team was already organized in 1982 and worked together for many years before the canal became fully operational in 1998. The WUA was initiated by first getting farmers in the command area to discuss and determine how a WUA would function. They had to convince all the potential members on the idea of water shares and how they would be distributed to the entire area influenced by the project.

The Andhi Khola WUA (AKWUA) supervises annual maintenance of the system by the irrigators. The executive committee has four

women members out of the thirteen seats. The Andhi Khola hydropower component contributes about NRs. 400,000 annually to the operation of the system; and the District Irrigation office in Syangja has also provided some financial support. Major rehabilitation of some of the canals was undertaken with World Bank support.

Kalleritar Irrigation System initiated its WUA in 1994. At that time, it was registered under the Association Act. Later, it was also registered with the Irrigation Regulation in the District Irrigation Office of the District Headquarters. Annual operation and maintenance are undertaken by the WUA. The delivery canal is 11 km long and water leaks became serious enough to cause water shortages in the command area. Hence, they obtained a grant for repair of the canal annually.

Chhattis Mauja has a 3500-ha command area spread over 58 villages (mauja) at present. It has a four-tier irrigation organization: mauja WUAs, Regional WUAs, a Central Committee, a General Assembly, and a joint committee between Soraha and Chhattis Irrigation system [Yoder 1994, Appendix1: 105-110]. Chhattis Mauja has (a) a supportive policy, regulatory and legal environment that recognizes the irrigation community's water right, (b) a capacity to mobilize resources for O&M, (c) benefits exceed the costs of participation, and (d) an effective collective choice arrangement [Merrey 1996].

These six irrigation systems have survived, even thrived, for many years as self-governing, self-supporting systems. A decade long Maoist insurgency (1996-2006) brought many socio-political and cultural changes, yet these WUAs learned to adapt to the challenges and were able to maintain the irrigation systems' productivity.

They are governed and managed by the irrigators themselves through their representatives, selected for specific periods of time. Their general assemblies approve rules, regulations, and policies, and a workplan which is implemented by the executive committee. The executive committee members are accountable to the general assembly. Adherence to the rules and

regulations is collectively supervised and punishment for non-compliance is decided collectively.

V. WATER RIGHTS AND OBLIGATIONS

The early studies of FMIS were groundbreaking in showing the variety of ways that communities had identified to allocate water rights and corresponding obligations for system construction, operation, and maintenance. Each of the irrigation systems discussed in this review uses a different method to allocate its limited irrigation water among members' farms.

In Argali, the Raj Kulo command area has some members with primary and others with secondary water rights. The canal was originally built for paddy irrigation. Presently, landowners with fields that were leveled for paddy cultivation long ago are entitled to the primary right (Barkhe pani) to use all the available water during the monsoon paddy growing season. Owners of nearly double the Raj Kulo's command have secondary water rights for winter crops (Hiude pani). Secondary right holders with fields downstream can use excess drainage water from the Raj Kulo also to grow paddy. In a dry year, when water supply is insufficient for continuous irrigation to all fields, primary water right holders switch from continuous irrigation to timed rotation based on the size of a farmer's plot as a percentage of the entire land area designated for primary rights holders. In such periods, secondary right holders get little or no water. The record keeper of Argali WUA establishes a water delivery schedule to rotated deliveries among the system's many branch canals. During the non-rice growing season, much less canal maintenance is required; it becomes the responsibility for those whose turn it is to irrigate to attend to the maintenance.

Since the 1980s, Raj Kulo infrastructure improvements, especially 2002/3 canal rehabilitation with financial support from the World Bank, have made water delivery very reliable, enabling a more diverse cropping pattern. The primary/secondary water rights have not changed, but excess water in the paddy growing period has increased and can be used

more effectively by the downstream secondary rights holders.

In Chherlung, water rights in both Thulo and Tallo Kulo are obtained by purchasing a share. The initial investment to build the Thulo canal was a payment made in 1928 to a contractor in the amount of NP Rs. 5000 plus 0.12 ha of land in the planned command area. The total investment cost for the canal by the time the first water was delivered was NP Rs. 5500 [Yoder 1986]. To share the water equitably among the contributing investors, a weir was installed in the canal just above the fields. The total opening in the weir was 50 inches, with each inch of opening representing NP Rs 100 investment. The opening for a farmer who invested 100 Rs was one inch wide, and for Rs 500 investment five inches wide. The water from each individual opening is delivered to that farmer's field by a smaller canal which that farmer is responsible to maintain.

As the canal was improved and enlarged, the water supply became more than sufficient for the farmers who had invested the most to build the canal in 1933. Farmers who initially were skeptical that a seven km-long canal could be successfully built, offered to purchase a share of the water from those who had excess. The irrigation members agreed that adding members would help reduce each farmer's responsibility for the cash and labor necessary to maintain the canal and came up with the idea of selling shares of the water based on their initial investment. They established a system whereby anyone in the command area of the canal could purchase a share of water from any other farmer with irrigation rights in the canal that is willing to sell some of his/her share. The transaction is between the two farmers but also requires changing the number and size of openings in the proportioning weirs. They have now developed a system of share certificates for each irrigation member with a copy for the system WUA management which keeps the records.

Because of the ability to purchase and sell water rights, the irrigation system that was initiated by only a small group of farmers has, during the

intervening years, spread irrigation access to every farm with land within the canal's command.

Chherlung irrigation water is now considered to be community property, but the water share owners have the right to use the water. Maintaining and managing the canal requires collective effort that is governed by the rules and regulations laid down by the WUA general assembly. In Thulo Kulo, after much deliberation, the WUA decided to install a community-owned mill powered by the irrigation water and managed by the WUA. The money earned was used to pay the loan taken to install the mill and is now used to strengthen and maintain the canal. With the electric grid connected to the village, there are now small electric mills in the community, but the hydro-powered mill still operates during the irrigation season.

In Chhattis Mauja, water rights and responsibilities of each of the 58 maujas are based on the number of kulara (shares) that each village holds. One kulara is equivalent to 17.5 ha. irrigated area. Kulara determine the number of votes that a mauja has at a meeting and determines both the number of persons that need to respond to a call for labor to maintain the main canal and how much water the mauja will receive. Each mauja, as far as possible, has a dedicated secondary canal from the main canal. The outlet size to the mauja is fixed according to each village's kulara. Depending on the water requirements in the mauja, the number of kulara can be increased or decreased and the outlet is then adjusted accordingly. The mauja manages the labor for kulara contributions when called for by the WUA and record is kept by the supervisor (Meth Muktiyar) of Chhattis Mauja.

Some sections of Chhattis Mauja are also part of Nepal's Lumbini-Bhairhawa Groundwater Project. Those mauja requested that their kulara (water share and contributions) be reduced. Similarly, Kumari village, which originally initiated building the canal, now receive enough seepage water from upstream irrigators that they don't need much canal water to meet their needs, so they only send nominal kulara to retain their membership in the system.

The Andhi Khola irrigation system was conceived in the 1980s as a pro-poor irrigation system, with water considered as the intervening factor for poverty reduction. To address poverty, the project designers made a clear separation between land and irrigation water. Inspired in part by Chherlung's Thulo Kulo, Andhi Khola water shares could only be obtained by contributing labor during construction of the irrigation system. Each landholder within the project area that contributed labor received a water share based on labor contribution. Also, landholders within the irrigated area with larger land holdings than estimated to be necessary for subsistence² were required to sell up to 10% of their land to the Andhi Khola WUA, which paid the owners the market price for the land. By this process, the Association collected 12 ha of land by 1999; this was distributed to 53 out of 137 applicants that were either landless or marginal farmers. Each family member in the command area owns at least 10 units of water shares.

Based on the project agreement, for the rice growing season, June to October, 642 liters/second of water is diverted from the headrace tunnel of the hydro project to the irrigation system. With this discharge in the main canal, the water per share was calculated to be 0.025 liters per second requiring 80 shares to achieve the expected 2 liters per second to irrigate a hector of rice. For the remainder of the year water delivery from the hydro project is reduced to 300 liters/second since wheat, maize and other crops grown in this period require about half as much water as rice. The WUA considers the inflow to the irrigation system as 25,000 units of water shares to be distributed to all parts of the defined project area. Shareholders who earned more shares from their labor working on the irrigation system construction than they had land to irrigate are free to sell their shares to households with

more land than their construction labor-earned water allotment would cover.

Kalleritar Irrigation system has focused on paddy cultivation. The canal bringing water from the source is about 11 km from the command area. All the water users are required to contribute to maintenance of the physical infrastructure of the system. During paddy plantation time, a water distribution schedule is prepared for each tar (river terrace) by the WUA. Each tar appoints a person to distribute water according to the schedule agreed by the farmers at a WUA meeting.

VI. PHYSICAL IMPROVEMENTS RESULTING IN CHANGES IN RULES AND ROLES

All six irrigation systems have gone through major physical rehabilitations that improved difficult and weak sections of the channels. Argali's Raj Kulo received financial support for rehabilitation from various sources, including the World Bank and District Irrigation Office.

Chherlung Irrigation systems, with their own and some government funds, improved their canals by repairing leaks and rebuilding the canal through landslide prone areas. Similarly, Chhattis Mauja received funds from the Rupendahi District Irrigation Office to improve the structure.

The Butwal Power Company has provided funds to the Andhi Khola irrigation system for annual maintenance; and the World Bank has funded improvements in the physical infrastructure.

The 2015 earthquake in Nepal caused major damage to the Kalleritar irrigation system. Subsequently, earthquake reconstruction funds enabled rehabilitation of the entire system. This made the physical structures much stronger and cheaper to maintain [Liebrand 2019].

Whereas previously women and Dalits (low caste groups) were not allowed to participate in the maintenance work in all irrigation systems because they might ritually pollute the water, these restrictions have been dropped in all of our case study areas. Where males have migrated out

²Based upon a socio-economic survey report of families living in the area planned for irrigation, food production for subsistence was estimated to require 0.036 ha of irrigated land or 0.25 ha of rainfed land per person. See Poppe, Joy, 1982, Socio-Economic Survey Report, Andhi Khola Project, Kathmandu: United Mission to Nepal.

for employment leaving women to manage farms, the women can pay cash instead of providing labor for maintenance. Women have played roles to influence WUA decisions in their favor, such as paying cash rather than contributing labor for maintenance by male out migrated households [Meinzen-Dick et al. 2022].

VII. ROAD ACCESS AND URBANIZATION

The road network in Nepal has expanded dramatically. Forty years ago, Argali and Chherlung were isolated hill villages, up to several hours' walk from the nearest market town. Argali is now served by the Tansen-Tamghas highway and linked by the Kaligandaki corridor to Mustang, as is Chherlung, enabling the sale of agricultural produce either to Gulmi District or to the large Butwal market center and to the northern districts. Andhi Khola is also connected to markets by the Sunauli-Pokhara Highway and Kali Gandaki Corridor. Kalleritar Irrigation system now has access to a road via a new vehicle bridge across the Trishuli River, linking it to markets along the road and in Kathmandu.

The effects of road expansion are even more dramatic in Chhattis Mauja, which is in Butwal and Tilottama Municipalities, located near the crossroad of two major roads, the East-West and Sunauli-Pokhara highways. The Butwal-Bhairawa corridor is an industrial area and young people can easily find employment. Many rural youths have out-migrated and many of those who remain are not attracted to agriculture. It is mostly the older generation who are engaged in agriculture in the Chhattis Mauja system.

Land values have risen tremendously, making the sale of land plots for housing attractive. By selling their land and putting the money in the bank, the annual interest from the cash deposits brings more income than they could earn from agriculture production. Within the command area, urbanization has taken place especially in the head end. Solid waste and household wastewater are dumped in the irrigation canals, polluting the water and blocking flows. However, because urban residents are not involved in irrigation management, they are not concerned

about the problems this generates for the irrigators.

VIII. OUT-MIGRATION, CHANGING GENDER RELATIONSHIPS, AND IMPACTS OF AGRICULTURAL MECHANIZATION

By 2010-2011 over half of Nepali households had at least one migrant, either within Nepal or internationally [NCBS 2011]. Among our sites, migration is most prevalent in Argali. Of the previous 500-600 households in Argali, many men have migrated for the long term to the Indian Army or short-term employment in India, or to other parts of Nepal. There are also students who go out for higher education and a few go to the Middle East. There is therefore frequently a shortage of manpower for agricultural and irrigation activities; hence, women must take care of agricultural and irrigation activities.

Partial mechanization has enabled getting rid of oxen which were expensive to keep because of fodder requirements and reduced the burden of agricultural activities for women. The Irrigation Policy and WUAs encourage women to undertake winter vegetable cultivation to earn more, and the "paicho pasal" (Cooperative Shops) have become outlets for the sale of vegetable products and also access to seeds and fertilizer.

In Chhattis Mauja, out-migration for employment has caused a labor shortage which is largely met by mechanization. One alternative is to hire labor from other districts; another is to rent out the land on fixed rent or through share cropping. The big landholders tend to prefer mechanization. Smallholders depend on hired laborers of landless or small farmers who come in groups from adjoining districts.

Another important source of agricultural labor used to be the parma system of labor exchange among households, but it is no longer practiced in Chhattis Mauja or many in other systems. As a result agricultural activities are now primarily based on cash payment. Remittances have also played an important role in the monetization of irrigated agricultural activities in Nepal.

While out-migration has caused labor shortages, in many cases, a supply of labor may be available from adjoining districts. An agriculture-specialized labor force has emerged. Landowners contact such groups, especially for paddy cultivation. Gangs of laborers come to do land preparation, planting, weeding, and harvesting. In such cases, the role of women has become that of managing of laborers, reducing their burden of agricultural activities. The telephone has become an effective means for them to mobilize laborer gangs.

In Andhi Khola, it was reported that out-migration has declined considerably since the irrigation system was built. Irrigation water is easily available for three crops. Women report that their involvement in agricultural activities has increased due to the increase in cropping intensity.

A recent study of 336 WUAs by phone interview and 10 detailed case studies, including Argali, Chhattis Mauja and Kallaritar [Meinzen-Dick et al. 2022], found a range of responses to male migration. This included adapting WUA rules to allow for women's participation, and to monetize the contributions for maintenance or even contract out some of the major maintenance.

IX. ROLE OF NEW TECHNOLOGY

Forty years ago, draft animals were used for ploughing and land preparation. Now, particularly in the terai, some farmers own tractors and most communities have tractors available to rent for plowing and land preparation. In the hill systems, where plots are small, engine-powered tillers are widely used for land preparation.

The use of tractors and tillers has changed livestock raising practices. Since bullocks are no longer needed for plowing, they have been removed from most farms. Fodder collection, mostly done by women, has either been reduced or shifted to raising additional milk cows or buffalo to increase milk production.

All the communities have been connected to the national electric grid and the mobile phone system. Communication with family members

who have moved to other areas or are working abroad keeps families connected.

X. CONCLUSIONS

A common feature across these cases is that maintaining and managing the canal remains a collective effort. Our study of these irrigation systems demonstrates the truth of Uphoff's [2006:387] observation that FMIS in Nepal.

... are not static entities, rather they are dynamic systems which are influenced for change both by internal and external factors.

The following are the most salient changes we observed in these six irrigation systems:

- The systems have been experiencing the impacts of urbanization. For example, the upstream area of the Chhattis Mauja canal is now an urban settlement. Due to the lack of control by the municipality, solid waste and sewage from households enters the canal, essentially turning the canal into a sewer. Here one sees a conflict between the jurisdictions of the local Municipality of Butwal and that of the Chhattis Mauja WUA.
- Out-migration of young people, changes in gender relationships, and impacts of agricultural mechanization have resulted in major changes across the six systems, with women assuming larger roles in some sites, and mechanization used to reduce labor burdens for system maintenance and agricultural production.
- Technological change and road networks connecting these systems have led to changes in agriculture practices and cropping patterns.

Despite these changes, the WUAs on all six systems have adapted and are still functioning as self-organized and self-regulating multi-tier organizations. If they continue as self-governing systems and self-regulating systems, they will be able to continue adapting and providing services for the next several decades.

An important strength of FMIS is their flexibility in rule formulation and implementation. For example, Chherlung introduced tradable water

shares. Andhi Khola at construction gave everyone water shares based on their contribution to construction and regardless of their landholding and included a hydropower system providing power to the community, thus integrating energy, food, water and poverty alleviation.

In analyzing the irrigation systems in the Nepal Irrigation Institution Systems (NIIS) database and other systems, Pokhrel [2016] concluded that the FMIS were able to continue because of inherent attributes, such as flexible rules and flexible rule enforcement. Their flexible governance has resulted in farmers perceiving fairness in rule enforcement and irrigation system governance. A longitudinal study of the performance of irrigation systems in the Indrawati River Basin found that those systems based on the consensus of large numbers of the members continued to survive during period of political uncertainties [Ostrom et al. 2011].

Argali, Chherlung and Chhattis Mauja have served as training centers under a pioneering Farmer-to-Farmer Training program [Pradhan and Yoder 1989]. In 1981, The World Bank provided financial assistance for irrigation system construction or rehabilitation. The researchers working at Argali, Chherlung and Chhattis Mauja facilitated visits from farmers in the new or rehabilitated systems to the three self-managed systems for direct interactions between the guest and host system farmers. The guest farmers asked many questions; the direct exposure to these systems' management gave the guest farmers the feeling that, "if they can do it, why not we?" Since then, the Institution Development Division of Department of Water Resources and Irrigation has adopted F-F training as a way to strengthen the capacity of farmers to manage irrigation systems, and these systems continue to host field visits.

Policymakers and researchers can continue to learn a lot about social transformations from these irrigation systems. They have not only successfully adapted to multiple changes occurring in rural areas but have pioneered farmer-to-farmer training programs for both

other farmer-managed systems and for government irrigation schemes. The concept has been extended to other countries, including Pakistan, Nigeria and Bhutan. When the authors began their research careers 40 years ago, farmer managed-irrigation systems were not even recognized by the Government; they were perceived as "informal", inefficient, and unproductive. The consistent and quality research carried out by the authors and others has helped the Government and donors to recognize their importance for food production, job creation, and poverty alleviation.

Finally, as Liebrand [2019] observes in an otherwise critical review of the history of research on FMIS, the multiple researchers who have studied these systems over the past 40 years have demonstrated the potential for high-quality in-depth qualitative case studies to yield important insights into the realities of irrigation at local levels and to influence government policies. We believe that the new generation of researchers will continue this tradition, not only in Nepal or even Asia, but in Africa, where irrigation as practices are highly diverse.

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Polemic on Human Rights Case is Still Rolling in Eastern Indonesia

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ABSTRACT

The purpose of this research is to find out the human rights problems that occur in Papua, why the issue of human rights violations in Paniai Regency, Papua Province, is reoccurring and what is the role of the state in protecting its citizens regarding human rights in Indonesia . The aim of this research is to find out the role of the state in protecting human rights in Indonesia. The research method used in this research is normative research method. This research was conducted through an approach to further study the legal basis by reviewing the applicable laws and regulations regarding human rights issues that occurred in Paniai Regency, Papua. The finding in this research is that the role of the state is in protecting the human rights of its people which aims to protect human rights itself. However, the problem of resolving human rights cases that occur must be carried out fairly and transparently in carrying out the settlement process, bearing in mind the state's obligation to carry out its role as a protector of human rights for all its people, must carry out according to the rules and every right must be fulfilled.

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Polemic on Human Rights Case is Still Rolling in Eastern Indonesia

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ABSTRACT

The purpose of this research is to find out the human rights problems that occur in Papua, why the issue of human rights violations in Paniai Regency, Papua Province, is reoccurring and what is the role of the state in protecting its citizens regarding human rights in Indonesia. The aim of this research is to find out the role of the state in protecting human rights in Indonesia. The research method used in this research is normative research method. This research was conducted through an approach to further study the legal basis by reviewing the applicable laws and regulations regarding human rights issues that occurred in Paniai Regency, Papua. The finding in this research is that the role of the state is in protecting the human rights of its people which aims to protect human rights itself. However, the problem of resolving human rights cases that occur must be carried out fairly and transparently in carrying out the settlement process, bearing in mind the state's obligation to carry out its role as a protector of human rights for all its people, must carry out according to the rules and every right must be fulfilled. however in practice Injuries to human rights are still commonly encountered as a result of injustices that come from the authorities themselves.

Keywords: ham, paniai, accountability and justice.

I. INTRODUCTION

Issues and news related to human rights have always been a polemic because human rights are inherent rights of a person that cannot be contested by anyone. Problems that continue to surface regarding injustice that interferes with a person's human rights are increasing day by day.

In fact, the laws governing human rights are very detailed. Provisions for constitutional guarantees of human rights are very important and even considered as one of the main characteristics of the rule of law principle in a country. However, in addition to human rights, it must also be understood that everyone has obligations and responsibilities that are also fundamental. Human rights are universal, interdependent and interdependent. The international community must act fairly in matters of human rights, on a basis of equality and concern. Even though the government has ratified many human rights instruments, they have not been properly implemented by law enforcement officials who are authorized by the government. Meanwhile, the political rights and legal status of men and women in the eyes of a country cannot be separated from the perspective of human rights (HAM) of that country. In the eyes of the Indonesian nation as a member of the international community, human rights are essentially the same as human rights in the eyes of the nations of the world, as stated in the Universal Declaration of Human Rights, in particular the Universal Declaration of Human Rights. Statement. Human Rights proclaimed by the United Nations on December 10, 1948.

Every person throughout life since before birth has essential rights and obligations as a human being. The formation of a state or government, for whatever reason, must not eliminate the principle of rights and obligations that must be borne by every human being. Thus the guarantee of rights and obligations is not determined by a person's citizenship status. Everyone, wherever they are, must be guaranteed their basic rights. At the same time, everyone, everywhere, must respect the human rights of others as appropriate. A balanced perception of the existence of fundamental rights

and obligations is an important feature of the basic conception of Indonesian people and humanity that is just and civilized. The Declaration of Human Rights in Indonesia has existed since time immemorial, but it is only committed to the basic directives of the state, namely those contained therein.

Even though the law has a broader purpose, namely to maintain legal authority, government power over legal norms that are violated regardless of the perpetrator's economic and social status, protect the interests of the state, society and individuals and prevent the spread of crime. The government's efforts to resolve gross human rights violations through mediation efforts primarily target gross human rights violations that occurred before the enactment of the United States Human Rights Court Act. This has been said in the discussion of the legal basis, particularly with regard to law. During the discussion, it was stated that the government is currently working to establish a Joint Truth and Reconciliation Commission to handle six of the seven cases of gross human rights violations investigated by Komnas HAM, namely:

Starting from the mysterious shootings from 1982 to 1985, the 1989 Talangsari Lampung incident, the enforced disappearances from 1997 to 1998, the May 1998 riots, the Trisakti incident, the Semanggi I and II incidents, and other tragedies. 7 of 1998 and 8 August 2014. Four residents were shot dead and 21 others were injured. injured when residents protested against TNI security forces who had beaten a group of youths the day before. These cases will be resolved through non-judicial means, namely mediation. This was done because it was difficult to find evidence, witnesses and suspects, because gross human rights violations had been going on for a long time as a result of the application of human rights and law in Papua was not expected by the people. Papua, where there are obstacles in the implementation process. legislation for civil society. Many pro-democracy activists have been killed before being tried, while the Indonesian security forces responsible went unpunished or went unpunished. As a result, human rights are seen as a threat to national policies and

regulations. For Papuans in an international context, access to Papuans is restricted because the government limits Papuans' contact with the outside world, such as forbidding members from visiting senators, congressmen, diplomats, foreign journalists, and outside aid workers nation. The author will examine the causes that led to the internationalization of human rights violations in Papua, because the author realizes that human rights violations experienced by people in Papua are increasing. Compared to previous years, the author will write about human rights violations, both big and small.

II. FORMULATION OF THE PROBLEM

Based on the background above , the author asks a question Study:

- Why did the issue of human rights violations occur in Paniai District?
- What is the responsibility of the state to resolve human rights cases?

III. RESEARCH PURPOSES

The aim of this research is:

To find out and analyze the factors causing the internationalization of the issue of Papuan human rights violations.

Benefits of research

This research is expected to provide benefits, including:

- Contribute to the development of the study of Law in the future.
- Provide information and become material for study for legal researchers, as well as observers of international human rights issues.
- Provide information to academics and practitioners who make policies in relations between countries in terms of overcoming conflicts in an area.

IV. RESEARCH METHODOLOGY

The method used in this study uses the Normative Research method, where the research steps include:

V. TYPES OF RESEARCH

This type of research is legal in nature, especially research on laws and regulations (in this case also research on international conventions) and library techniques (library materials, materials and journals). Soekanto and Mamudji call this type of research library research because normative legal research is carried out by examining library materials or secondary data. This study analyzes and examines in depth the legal protection for civilian victims of non-international armed conflicts (internal armed conflicts) in Papua, in this case considering the suitability of Indonesian law compliance with international humanitarian law applied in that country. Papua (law at 9 Soekanto in Susanti and Efendi, 2019, Law Studies, Sinar Graphic Publishing House, Jakarta, page 19 books and applicable laws). Let this method find results that prove its objectivity compared to the Civil Protection Analysis (Papua).

VI. DATA COLLECTION TECHNIQUE

The data collection method used by the authors in this research is to use a literature study, which collects data from documents related to the issues to be discussed and then analyzed. This material is in the form of books, documents, journals, magazines, newspapers and websites or reports related to the issues the author will discuss. In addition, the authors conducted field work at the location that became the object of this research, namely Paniai Regency.

VII. DATA TYPE

In this article the author uses primary data, namely data sources that provide data directly to the author (interviews, report data, photographic documents and other operational data). And secondary data are those that do not provide data directly to the author, such as through documents (books, articles, the internet and other electronic media) (Hadir 1998, 137). The data analysis technique used by the author in analyzing research data is a qualitative analysis technique.

Problem analysis is a description that starts with existing data, then connects these facts with other facts to make appropriate arguments.

7.1 Sources of Legal Materials

Main legal documents Main legal documents are binding legal documents, including:

- Convention on Respect for the Laws and Practices of Land Warfare (Convention IV The Hague 1907).
- Geneva Convention Concerning the Protection of Civilians in Time of War (Fourth Geneva Convention 1949).
- ICTY Tadic 1995, Prosecutor v. November 27, 1950
- Presidential Decree Number 50 of 1993 concerning Komnas HAM
- Presidential Decree No. 96 of 2001 amended Presidential Decree No. 53 of 2001 concerning the Establishment of a Special Human Rights Court at the Jakarta District Court
- MPR Decree No. XVII/MPR/1998 concerning Human Rights.
- Convention Against Torture and Other Degrading, Inhuman or Cruel Treatment or Punishment (1965). Komnas HAM Regulation No. 002/Komnas HAM/IX/2011 concerning procedures for investigating gross human rights violations.
- Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the protection of victims of international armed conflicts (Protocol I), 8 June 1977.
- Additional Protocols to the Geneva Conventions of August 12, 1949 and Concerning the Protection of Victims of Non-International Armed Conflicts (Protocol II), June 8, 1977. The 1945 Constitution of the Republic of Indonesia.
- law number. 39 of 1999 concerning Human Rights. Law Number 8 of 1981 concerning the Criminal Procedure Code.

7.2 Secondary Legal Materials

Secondary legal documents are legal documents that explain primary legal documents such as research results and works of legal science such as

legal journals in electronic or printed media, publications, scientific books including theses, theses, theses.

7.3 Tertiary Legal Materials

Tertiary legal documents are legal documents that support first and second level legal documents by providing guidance, understanding and interpretation of other legal documents.

Techniques for collecting legal documents

Legitimate document collection techniques are one way to obtain and collect the necessary data. In this study, the technique used by Library Research Library Research examined written information about the legal protection of civilians in internal armed conflicts and human rights from various sources and direct publications such as legal works and scientific journals.

Document review Document review includes examining written information about titles sought and those not publicly published. Such as theses, dissertations, theses and international journals. Analysis of legal documents. Data in the form of primary data and secondary data will be studied using qualitative methods in the form of logical and systematic descriptions, then analyzed to get an idea of how to solve the problem, from which conclusions are drawn deductively, knowing from general matters to specific matters.

VIII. DISCUSSION

8.1 Definition and History of Human Rights

Human Rights (HAM) deals with the basic concepts of people and rights. Generally, when we hear the word human, we automatically think of beings with feelings, thoughts, instincts, emotions, etc. Human Rights are rooted in the human belief that all humans as creatures created by God are equal and equal. Humans are born free, have the same dignity and rights. Therefore, people need to be treated equally and in a civilized manner. According to Briand Orend, someone who is allowed to have human rights must be a living human being. Dead or non-existent persons cannot be classified as human rights holders. 17 Orend further explained that the criteria for

someone who is classified as a human rights person is someone who has an emotional reaction. Evaluations such as affection, emotion, sympathy, empathy, are factors that respond to immediate reality. It is this element that makes a person a person. Human rights are not only related to the concept of human beings but also related to the concept of rights. Rights, as Jack Donnelly believes, can be viewed from two perspectives. First, right means honestly emphasizing the normative aspect, namely the right or wrong of something. Second, rights can also mean rights, meaning that someone has the right to something. If the first aspect concerns standards of behavior that emphasize the obligation of right-holders to respect certain predetermined norms, the second aspect focuses on a person's right to enjoy something that is his right. Human rights are basic rights that enable people to shape their lives with respect for freedom, equality and respect for human dignity.

The rights which emphasize that people are free to choose their actions are fundamental expressions of human dignity and worth, and are at the heart of the formulation of a number of other rights, such as liberty, freedom of speech, conscience, religion). , assembly and association). , equal rights (equality before the law and protected by law, protection against discrimination on grounds of sex, race, colour, religion, national or other social origin), political rights (right to vote, equal access to public service or public rights, freedom to form political parties, right to petition, etc.), economic rights (rights) to private property, freedom of movement, etc.), collective rights (right to self-determination, protection of minorities and groups), rights to development, etc., the right to due process (especially with regard to the application of criminal law) All of these provide all human beings with the legal right to live in accordance with the principles of freedom, equality and human dignity.

Article 1 of Law Number 39 of 1999 concerning Human Rights states that:

"Human rights (HAM) are a set of rights that are inherent in the nature and existence of humans as creatures of God Almighty and are His gifts that

must be respected, upheld and protected by the state, law, government, and everyone for the honor and protection of human dignity. Based on the law, it is emphasized that there is an obligation for every individual to respect the human rights of others.

IX. HUMAN RIGHTS INSTRUMENTS

At the United Nations, commitment to the realization and protection of human rights and respect for basic human freedoms is emphasized globally on several occasions, including in Article 1 paragraph 1.3:

"Increasing international cooperation in solving international problems in the economic, social, cultural and humanitarian fields, as well as promoting and promoting respect for human rights and fundamental freedoms." available to everyone regardless of race, gender, language or religion. Human rights and freedoms are also stated in the 1948 Universal Declaration of Human Rights through article 2: "Everyone is entitled to all the rights and freedoms set forth in this Declaration, without discrimination of any kind, such as race, skin colour, sex, language, religion, opinion, political or other opinion, national or social origin, wealth, birth or other circumstances.

This commitment was then followed up by the United Nations through the establishment of legal instruments that regulate human rights as follows:

- International Covenant on Civil and Political Rights (ICCPR) The International Covenant on Civil and Political Rights was ratified by the UN on December 16, 1966 and entered into force on March 23, 1976. and its articles consist of 6 chapters and 53 articles and the Convention is mandatory the countries that ratified this agreement (agreement).
- Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment) entered into force in January 1987. Indonesia has ratified the Convention through law no. May 1998. This convention adds to the provisions of the Covenant on Civil

and Political Rights. This convention obliges States to take legislative, administrative, legal or other effective measures to: prevent acts of torture, deportation, refoulement or extradition of a person to another country if there is sufficient reason to suspect that the person will be in danger (as a result of torture). ensuring that anyone who claims to have been tortured in any jurisdiction has the right to complain, ensuring that their case is heard quickly and fairly by the competent authorities. · ensure that complainants and their witnesses are protected from harassment or intimidation as a result of their complaint or testimony. ensure that victims receive compensation and (the right to receive) compensation that is fair and proper. The implementation of this Convention is supervised by the Committee against Torture (CAT) which was formed based on the rules contained therein.

X. STATE RESPONSIBILITY FOR VICTIMS OF HUMAN RIGHTS VIOLATIONS

Definition of State Responsibility The definition of state responsibility when referring to the Legal Dictionary, namely:

"A state's obligation to make reparations arising from failure to comply with legal obligations under international law."

Based on this formulation, state responsibility can be understood as an obligation to make reparations (compensation) that arises when a state makes a mistake in carrying out its legal obligations under international law. Whereas in the Black's Law Dictionary there is only a narrow definition of responsibility, namely accountability or the ability to attribute responsibility. Sugeng Istanto offers an understanding of state responsibility by using the term state responsibility. According to him, state responsibility is the state's obligation to provide a calculated response to something that has happened and the obligation to repair any losses that may be incurred. In accordance with national legal systems, international law also recognizes responsibility for non-compliance with

obligations under international law. There are two concepts of state responsibility.

Serious human rights violations began to be felt in 2000 which led to the kidnapping and murder of a Papuan leader named Theys Hiyo Eluay on 10 November 2001. The Papuan people and human rights defenders have never forgotten this incident. Murder and photos of Papuan Theys leader Hiyo Eluay. Later, this case was revealed to the public, causing a heated debate between human rights defenders in Indonesia and the people of Papua. Then came a group of human rights activists from students and civilians who fought for the fate of the Papuan people (Giay 2003, 24). In addition, there are several human rights cases in Papua that have attracted the attention of the author for research from 2012 to 2015. The first incident occurred on May 29, 2012, when the incident occurred. Dietmar Pieper, a German citizen, was shot dead. Previously, on May 25 2012, the National Human Rights Commission of the United Nations held its 13th session with the aim of reviewing the human rights policies of the government of the Republic of Indonesia. Several countries, including Germany, have spoken out about human rights violations in Papua (Haluk, Dead or Alive 2013, 198). The second occurred on June 14 2012, when Densus 88 Anti-Terrorists shot Mako Tabuni. Four bullets were found in the victim's body. The victim was shot at the Perumnas III Waena roundabout in Heram district, Jayapura (Markus 2013, 200).

The third incident occurred on December 16 2012, Huber Mabel was shot dead by the Jayawijaya police. Huber was shot dead in the village of Abusak, Kurulu district (SKPKC Franciscan 2012, 153). The fourth incident occurred on May 1 2013, Abner Magalawak was shot dead by the police. Currently, Abner is celebrating 50 years of the handover from the Papuan government to Indonesia. In addition, four people were injured and hospitalized. The government then banned human rights lawyers from meeting victims (International Alliance for Papua 2015). The fifth case occurred on May 11 2013, at 09.00 WIB, six members of Yonif Wimane Sili 756 were involved in an argument with Arton Kogoya. The drunk

victim shouted at them outside an internet cafe on Jl. Yos Sudarso (International Alliance for Papua 2015).

After an argument, Arton then went home to meet his friend who later became a witness. Six soldiers followed Arton and his friends, then shot Arton Kogoya six times (Papua International Alliance 2015). The sixth case occurred on January 26 2014, during a sweeping operation in Puncak Jaya Regency. Thousands then fled to Wamena, Nabire and Jayapura. The GIDI Church (Bible in Indonesia) was burned and the police tortured three people, Oktavianus Tabuni, Tigabur Tabuni and Caban Tabuni (International Alliance for Papua 2015). On Saturday, 2 April 2014, Alfares Kapisa and Yali Wenda were arrested during a demonstration at the Cendrawasih University (UNCEN) campus. They demand the unconditional release of political prisoners in Papua. The two were detained at Polda Jayapura for more than 24 hours and subjected to police torture and abuse (International Alliance for Papua 2015).

The eighth case occurred on August 26 2014, Martinus Yohame died and was found in a sack on Nana Island, Sorong Province. The police are suspected of being the mastermind behind the murder of Martinus Yohame (International Alliance for Papua 2015). The ninth occurred on 8 December 2014, when four indigenous Papuans were shot dead by soldiers and police, and seventeen others were injured. This incident occurred in Enarotali District, Paniai Regency. The shooting followed a peaceful demonstration in the form of a traditional dance (International Alliance for Papua 2015). There have been cases of shootings, arrests, closing of democratic spaces and other restrictions. Continuously, the conditions in Papua are increasingly concerning for the people of Papua and the minimal role of the government in the human rights violations that have occurred in Papua. The State of Indonesia as a sovereign country takes security measures for one of the provinces in eastern Indonesia which must be taken to maintain the integrity of the country. The reason for ensuring security in Papua is to quell rebellion or resistance by the Papuan people as treason. The government

designated Papua as a Military Operations Area (DOM) from 1978 to October 5, 1998. Even though the DOM status was revoked by the government in 1998, the facts show otherwise, it is clear that crimes against humanity are still occurring in Papua, where the Papuan people have directly experienced (Haluk, Against Freeport 2014).

So, for Papuans, protest is an attempt to put the problem in the right place. After that, every protest movement was always suppressed with weapons, "however" this suppression spread everywhere to civil or social life in Papua. Thus, the struggle for human rights in Papua began to be seriously discussed. Even emphasized by international organizations that view every event that occurs in written or oral form. Communities in Papua have also begun to form movement organizations that can advocate for the grievances of the Papuan people.

XI. HUMAN RIGHTS VIOLATIONS THAT OCCURRED IN PANIAI DISTRICT

The Origin of the Case of Human Rights Violations in Paniai, Papua Cases of human rights violations in Papua are not new cases, this case began on 7/12/2014. members of the Indonesian National Armed Forces (TNI) for driving a car and not turning on the headlights. However, this warning eventually led to an argument that led to the arrest of three teenagers by the military. Then, on 8 December 2014, in Enarotali district, Paniai province, a group of Ipakiye people came to the Enarotali Police and the Koramil to protest and ask for an explanation for the incident that took place on 7 December 2014.

In this action, the community held a demonstration by performing regional dances at the Polres and Koramil beaches. This dance is performed to express attitudes towards past abuse and harassment of mandarins. The plane also dispersed the community action with shots. This shooting occurred after a peaceful community protest. The shooting of an indigenous Papuan by the police and TNI left four people dead from stab wounds and hot bullets. Twenty-one people were also injured as a result of the persecution. One of

the youngest victims was an 8 year old boy who was shot in the arm.

Following the incident in Paniai on 7 January 2015, Komnas HAM formed a Fact Finding Team (TPF). TPF's mission is to provide recommendations to the government. Then, in the same year, 18-20 February, Director Nasution, head of the TPF, met with witnesses and victims. The results of the meeting were then reported to the media that there were signs of violations of the four elements of human rights. These factors are the right to be free from violence, women's rights, the right to life, and the rights of children. Komnas HAM also conducted investigations and gathered evidence for approximately 5 years, from 2015 to 2020. Based on the results of an investigation conducted by a special team to investigate gross human rights violations, a universal decision was made. Everyone unanimously decided that a human rights violation was a flagrant human rights violation. M Choirul Anam as the head of the special team said that the Paniai incident met the elements of a crime against humanity in the form of murder and persecution.

Komnas HAM also stated that the perpetrators allegedly responsible for this case of gross human rights violations were the XVII/Cenderawasih Regional Military Command and the Enarotali Regional Military Command, Paniai. In addition, there was evidence of violations committed by the police, but these violations were not considered as gross human rights violations. This decision was taken based on the results of the examination of 26 witnesses, examination of the crime scene (TKP), examination of several documents, discussions with experts and various other sources of information. witnesses, conducted interviews at the TKP, examined supporting documents for the settlement of this case, and held discussions with a number of experts. Key witnesses during interrogation included the Coordinating Minister for Politics, Law and Security, several POLRI officers and Papuan and Paniai security forces. However, the TNI, as the source of information on the incident, ignored calls from Komnas HAM to provide information.

Not only that, Komnas HAM has also collected evidence for forensic weapons testing, both in terms of weapons handling procedures and forensic testing procedures. Because it has been determined that this is a case of gross human rights violations, the authority to resolve this case lies with the Attorney General's Office. This is in accordance with the results obtained by Komnas HAM at the investigation stage. Currently, Komnas HAM has formed a team to collect preliminary evidence to be used as Komnas HAM documents which will be submitted to the Attorney General's Investigative Team to conduct an investigation.

After several times Komnas HAM submitted the results of the investigation, on December 3, 2021, the Attorney General's Office issued an investigative mandate. Based on the letter, an investigation team has been formed to investigate cases of alleged gross human rights violations in Paniai, Papua. The team of 22 senior prosecutors is tasked with finding and gathering more evidence from the Paniai case. This was done because the evidence previously collected by Komnas HAM was not sufficient to support the allegations of gross human rights violations raised so that the perpetrators could be found immediately. Given the unresolved cases of gross human rights violations in Indonesia, the principle stated in Article 1(3) that Indonesia as a rule of law cannot be predicted as a country. The protection of human rights has been consistently enshrined in law, and the regulations still seem too far-fetched to say they are working well. The justice promised by the state is only rules on paper that do not run optimally in practice.

Factors inhibiting the resolution of serious human rights cases in Paniai Based on the explanation above, several factors hindering the resolution of serious human rights cases in Paniai, include: The miscommunication between Komnas HAM and the Attorney General's Office is troubling., because it led to inconsistency in the handling of cases of gross human rights violations that occurred in Paniai. Therefore, there must be a relationship between the two agencies as stated in Law no. 26 of 2000 concerning the Human Rights Court.

With the acquittal of the human rights case in Paniai Regency on December 9, 2022, the single defendant for the Paniai human rights violations that occurred in Papua, namely Major Inf (Purn) Ishak Sattu, was acquitted by the panel of judges. the judges, of course, were acquitted, exacerbating human rights problems in Papua. Condolences to the victim's family. For information, the trial of the Paniai Papua human rights case was conducted by a special panel of judges at the Makassar District Court, South Sulawesi. After reading out the verdict, the retired TNI officer who was a liaison officer during the 2014 Paniai tragedy said the prosecutor's office should no longer try people who do not deserve to be punished. The protection of civilians who are victims of armed conflict is very important and requires the government to take firm action with the legal instruments used by the conflicting parties in a clear, fair and transparent, open and not arbitrary manner. For example, the case of armed conflict that occurred in Paniai Regency, Papua. The endless conflict only adds to the escalation of the conflict and ends in the loss of the lives of many civilians who must be protected by law.

For most indigenous Papuans, Special Autonomy is seen as a failure in many ways, so the rejection of Volume II has become ubiquitous through protests, workshops and public debate. Freedom of speech did not go as smoothly as expected. Many community members and students were arrested and detained. All demonstrations and discussions are prohibited and prevented. Not to mention the amendments to the special autonomy law which were carried out unilaterally by Jakarta without the active participation of indigenous Papuans. in article 77 of the Law on Human Rights No. 39 of 1999, which states that "the government is obliged and responsible for the law accepted by the unitary state of the republic of Indonesia. All this shows that what is written in the law must be carried out by the government as enforcer of law, regulations and responsibility.

XII. CONCLUSIONS AND RECOMMENDATIONS

12.1 Conclusion

- Internal armed conflict The provisions governing internal armed conflict are Article 3 of the 1949 Geneva Convention, Additional Protocol II of 1977 and the decision of the ICTY regarding the important events of Dusko Tadic. Particularly in the national law on internal armed conflict regulated in article 10 of Law no. 3 of 2002 concerning National Defense and Article 7 of Law no. 34 of 2004 related to the Indonesian National Armed Forces although this is not clearly explained in the law.
- Protection of the Civilian Population (Papua) in Internal Armed Conflict Provisions that apply to the protection of the civilian population (Papua) in armed conflict is the promulgation of the 1945 Constitution, Law no. 39 of 1999 concerning Human Rights and the provisions of international human rights treaties that apply in terms of the protection of civilians or civilians whose human rights are not protected and respected by the parties to the dispute in the homeland of Papua, especially rights that cannot be reduced. The Office for the Protection of Civilians (Papua) in the conflict that occurred in Papua uses national legal instruments, human rights and law as a legal framework for conflict-affected communities. The armed conflict in Papua is included in the category of civil unrest and tension.
- The Paniai human rights violation case was identified by Komnas HAM as one of the most serious human rights violations in about five years. Komnas HAM led the investigation and after submitting lots of evidence to the Attorney General's Office, on December 3, 2021, the Attorney General's Office finally issued an investigation warrant. Until now, the process of handling flagrant human rights violations in Paniai, Papua is still ongoing. Several factors contributed to the resolution of human rights violations in Paniai Province, Papua, including the lack of communication between Komnas HAM and the Attorney

General's Office, an institution that failed to carry out its mandate and function optimally. Not only that, Komnas HAM still lacks preliminary evidence to submit cases to the Attorney General's Office, has a definite interest in protecting the good name of the organization, and the government's promises have yet to be fulfilled.

- In the decision of the Ad Hoc Human Rights Court, the Makassar District Court acquitted the sole accused of gross human rights violations in Paniai, Major Inf Purn. Isak Sattu, is considered to have failed to provide justice for the victims, survivors, and their families. Civil society organizations that are members of the 2014 Paniai Monitoring Coalition consider that the acquittal shows the poor performance of law enforcement in resolving gross human rights violations and acquittals in cases of human rights violations in Paniai Regency add to the black list of human rights cases which are always ambiguous in the resolution process.

12.2 Suggestion

As the holder of the highest state office, the president is obliged to provide for the welfare of all his people according to the mandate enshrined in the 1945 Constitution so that people's trust in the government will recover. In addition, the importance of clarity over the settlement of gross human rights violations in Paniai, Papua by law enforcement officials is the goal of creating a peaceful and peaceful country for all. right. human rights as human rights held by other existing people. in Java, Sumatra, Kalimantan, or Sulawesi as compatriots of the Republic of Indonesia. Thus, indigenous Papuans also have the right to life, independence, and personal security, which must be protected, respected, and fully implemented by the state by applicable laws and regulations.

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The Strata Diana Patricia Jaramillo

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ABSTRACT

The strata by Juan Cárdenas is a transdisciplinary work that exceeds the meaning of a short novel; although in principle it starts from the need of a man to reconstruct some images of his childhood that he believes are the reason for his despondency; for his not being in the world, for his illness; in reality this event is just an excuse to go through a series of subsidiary stories that confront him with a profound reality: to recognize himself as a man who is dead but has not realized it, and with an imperious need: to heal. During the process, he must confront his own buzzing; that which is an eternal presence, and that of those who are part of his environment, through the action of multiple voices that participate in the same search, from different insights, social spaces, and geographical spaces. All of this is an exercise of thought that not only makes literature, and experiments with language but is also interested in Latin America, in its individual and collective memories, in the people who are not afraid of death because they have always been dead.

Keywords: strata, illness, buzzing, childhood, jungle, insomnia, ghosts, cane field, black people, pacific coast.

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ABSTRACT

The strata by Juan Cárdenas is a transdisciplinary work that exceeds the meaning of a short novel; although in principle it starts from the need of a man to reconstruct some images of his childhood that he believes are the reason for his despondency; for his not being in the world, for his illness; in reality this event is just an excuse to go through a series of subsidiary stories that confront him with a profound reality: to recognize himself as a man who is dead but has not realized it, and with an imperious need: to heal. During the process, he must confront his own buzzing; that which is an eternal presence, and that of those who are part of his environment, through the action of multiple voices that participate in the same search, from different insights, social spaces, and geographical spaces. All of this is an exercise of thought that not only makes literature, and experiments with language but is also interested in Latin America, in its individual and collective memories, in the people who are not afraid of death because they have always been dead.

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RESUMEN

Los estratos de Juan Cárdenas es una obra transdisciplinar que excede el significado de novela corta; aunque en principio parte de la necesidad de un hombre por reconstruir unas imágenes de su infancia que cree son la razón de su abatimiento; de su no estar en el mundo, de su enfermedad; en realidad este evento es apenas una excusa para atravesar una serie de historias

subsidiarias que lo confrontan con una realidad profunda: reconocerse como un hombre que está muerto pero no se ha dado cuenta, y con una imperiosa necesidad: sanar. Durante el proceso debe enfrentarse a su propio zumbido; a ese que es un eterno presente, y al de los que forman parte de su entorno, mediante la acción de múltiples voces que participan en la misma búsqueda, desde diferentes ópticas, espacios sociales y geográficos. Todo esto como un ejercicio del pensamiento que no sólo hace literatura, y experimenta con el lenguaje, sino que además se interesa en América Latina, en sus memorias individuales y colectivas, en las gentes que no temen a la muerte porque siempre han estado muertas.

Palabras clave: estratos, enfermedad, zumbido, infancia, selva, insomnio, fantasmas, cañaveral, gente negra, costa pacífica.

Obra: Los estratos **Autor:** Juan Cárdenas **Editorial:** Periférica.

I. INTRODUCTION

Estaba muerto como todos allá, invadido por un terror estúpido. Prefiero pensar en lagartijas ornamentales que ya perdieron la gracia, y en la casa de mi tía que en realidad es mi prima, y de cuanto disfruto sentarme bajo la mata de guama, así me escabullo del caldo oscuro del que hablaba mi nana cuando era un niño. Pero no, no he dormido, he perdido la cabeza, y vuelve el zumbido, y no me deja, y me arrebató este instante de brisa y palabras cálidas. Y pienso en mi tío, en que nunca lo imaginé un asesino, en que era un experto con el machete. Y con esa cara de viejito agradable, ante la premura de la muerte le tembló todo, estaba espantado por eso no habría una sola hoja de la Biblia, por eso se escabullía en las hojas de La Vorágine. Y me vuelve el recuerdo de la nana, y juro que intento reconstruirlo, me acompaña a todas partes, es

como estar siempre en tinieblas. Pienso que me vendría bien visitar a la muchacha de cara amargada pero que baila muy bien, que se le nota en la cara que es del campo y que tira como una degenerada; o busco a la psiquiatra para que me escuche como siempre lo hace y me acaricie el cabello y me muestre sus nuevas adquisiciones; todos esos muebles viejos de los que llena su casa; o mejor busco a mi mujer ¿Acaso es mi mujer aún? Ni siquiera sé en donde está, y tampoco me importa, ya no recuerdo desde cuando me dejó de importar. Y es que no quiero que me importe; mejor me fundo, me entrego a pensar, que nunca conocí el oso de anteojos, que en verdad quería conocerlo y buscar una sombra y buscar una sombra, y buscar una sombra. Me llega la imagen húmeda de los cañaverales y no quiero dejarla, no quiero dejar el roce, ni la brisa que se cuele entre las cañas; habito allí mientras duermo en casa, mientras voy a la fábrica y paso por ese vertedero hediondo; mientras mis socios, esos diablos que reverencio, hablan, yo voy a los cañaverales, y pienso que estoy enfermo, que me debo sanar de esta enfermedad, que en la selva quizás encuentre el remedio. Llego a casa y mi mujer no está, ya nunca está, ronda la ciudad, no sé adónde va, no quiso tener hijos conmigo porque nunca dejó de querer a su muerto. Ella también está enferma. Vuelvo a mis andanzas, a recorrer las calles y oler los cipreses mientras todos duermen. Mientras todos duermen me siento en la habitación de la casa modelo; me siento en la cama del hotel en el puerto; me siento en la cama del motel, me siento en mi cama, me siento incapaz de cargar conmigo. Y recuerdo el parque de diversiones, los gritos de la gente cuando los simios hostigaban a la dama en la jaula. Y me vienen los olores de la casita de tablas que se levanta en cuatro estacas, agua molida y viento raspado, y no la volví a ver. Quizás se llevó consigo al diablito del que ella hablaba. *ejque aquí toittoss estamo mueto*. Nunca entendí por qué pelaba palitos, la viruta en el suelo le decía alguna cosa o por eso se iba a buscar al oso de anteojos y nunca me llevó. Algo tenía ese enfermero. Algo tenía pendiente, como yo. Y ahora, veo buques enormes y a mi padre, y otro día no veo nada. Y la fábrica se puede caer, y yo la heredé, y tuve todo, y no hice nada con eso. Agua molida y viento raspado. Y cuando me

siento a oscuras sigo a la muchacha de cara amargada, y sigo a mi mujer, y llamo a la psiquiatra. Y la acompaño al galpón por todo ese desperdicio que es como oro para ella. Y me intereso por ese diario viejo que nada tiene que ver conmigo, que es de la época de mi padre. Es de Cali. Pero yo no digo nombres porque no me gusta nombrar a la gente. Y tengo que disimular que ninguna cosa me importa, como cuando fui a la galería y vi ese montón de piedras y hojas desperdiciadas. *ejque aquí toittoss estamo mueto*. Y que los indios tenían bloqueada la carretera, y que reclamaban por sus derechos. Si a mí ni siquiera me importan los míos. Yo me quedo con mi película de samuráis. Y viene el recuerdo y me siento un zombi. Y quiero buscarla y me voy a buscarla. Y voy al sanatorio y allí todas las mujeres se parecen. Y me beneficio de las amistades de la psiquiatra, ya no solo es la fiscal, ahora también el detective. Ese hombre menudito, dividido en tres partes, indio, médico yerbatero y detective, no sé cual de todos es mejor. Mientras lo encuentro, el ruido de las casetas, de los perros, de los barcos, de la gente, de mi cabeza, no me dejan en paz. Recuerdo la lluvia de ayer, las catástrofes y aquí apenas rebosa la alcantarilla, mientras que por allá la gente está encaramada en los tejados. Y los locutores callan los nombres de los desaparecidos. Hoy que si son útiles los nombres los callan. Y dan el nombre de los pueblos y de los generales y de los gobernadores, pero no de los desaparecidos. Tengo que encontrar a mi nana. Siento su llamado. Tengo que atenderlo. Y prefiero pensar en los cañaverales. Y me quedo como sembrado. Y pienso en el subdesarrollo de esa muchacha y me echo reír. Y pienso que está rota y que es una violenta en la cama y le gusta que le digan puta. Y yo me desdoble también. Y no me importa mi mujer. Y en la calle me paran los de la moto, y me preguntan de todo y me dejan ir. Y me acuerdo del hombre que se lanza al río. Y quiero estar sentado debajo del árbol de guama. Y no sé que haría mi nana. Nos vamos por el río, por el puerto, por el muelle, por la bahía y pasamos caseríos. Y él les da hierbas y la señora le quiere dar un brebaje. Y me dice es una bruja. Y entonces me convierto en fantasma. Un zombi. Un zombi. Con el olor de la selva. No le temo a la

selva. El detective me habla del remedio. El remedio me lo da en la selva. Allá no hay tamales. Ni arepa de choclo. Ni arroz frito. Ni mariscos. Allá alguien agoniza. Alguien piensa en el pueblo negro. En su liberación. Alguien celebra que ya no hay esclavitud. Sin embargo. Siguen muertos. De nada sirve leer a los poetas. En la selva. Que importancia puede tener Horacio. En la selva son más importantes los pajaritos. Encuentro al hijo de la nana. Ya no es tiempo de preguntas. Ella estaba muerta antes y ahora está muerta de verdad. Y su hijo con sonrisa nítida como la de la gente negra. No sabe mucho. Y yo que me dejo convencer de todo el mundo. Me jarto ese remedio. Los demás están mareados. Y yo no sé a dónde pertenezco. El chinchorro eta mariaao. La selva está mariaa. Y mi enfermedad o crece aquí o desaparece. Y pienso que soy el nuevo rico que critica la psiquiatra. Que mi apellido es apellido de terrateniente. O que mi abuela materna vivió en lo tiempos de la colonia. Y luego me encuentro conmigo. Y la recepcionista me dice Dr. y usted que hace aquí. Y ahí siento que se me salen los hígados por la nariz. Y siento el olor del puerto. Y veo la cara hermosa del detective. Y el me recoge del suelo. Y así todo vomitado. Me traen plátano frito con café. Y nos cuentan que mataron a dos pajaritos. Y que la fiscal encontró a un desaparecido. Y pienso con el estómago revuelto. Qué pesar que el celador no disfrutó de la piscina. Tengo que ampliar el cuarto de la nana. Entonces escucho el canto de la rana. En cambio del zumbido. Y le digo que como el putas. La muete también. Ya no hace falta grabar nada. Ni tomar pepas. Ni pronunciar nombres. Porque usted sabe que nunca me han gustado.

Con un vago recuerdo de la infancia, Juan Cárdenas nos introduce en una obra que encarna fielmente su título, pues todo en su interior está estratificado: personajes, lugares, acontecimientos, pensamientos, imágenes, escritura. Por su extensión, da la impresión de ser una novela corta, pero esto es un engaño a los sentidos, ya que, por la rigurosidad entre fondo y forma, implica unos principios científicos básicos en el lector: curiosidad e interés investigativo, con una repercusión técnica y humana: la profundidad para desenmarañar los misterios, la belleza y las

dinámicas con las cuales se nutre. Es necesario descuartizarla hasta sus fibras más íntimas, pues posee una escritura inusual. En efecto, es posible leerla sin estos ingredientes; pero dejará una sensación de incompleta. El carácter transdisciplinar que posee desde lo psicológico; estético; literario; filosófico; artístico; musical; político; sociológico; histórico; geográfico; gastronómico; periodístico; científico (investigación); y el más potente, el técnico en el sentido de las maniobras desde la creación literaria, desde la fuerza de la experimentación, la constituyen en una fuente de conocimiento impredecible e imprescindible.

En cuanto a la forma, la obra consta de tres capítulos interrumpidos juiciosamente por tres relatos que aparecen al final de cada uno en un tono y lenguaje distinto al usado en el gran entramado de la misma. A simple vista parecen descontextualizados, como las citas de Horacio y de la Constitución de Haití en las primeras páginas del libro. No hay ruedas sueltas aquí, todo está íntimamente ligado. La primera cita se relaciona con las lecturas del detective: *abre su mochila...Saca un libro... Y se pone a leer...Es una antología bilingüe de poesía satírica romana 8](P.175)* en este sentido el Dr. (narrador), se dice: *¿acaso un indio no puede leer a los poetas de Roma o lo que se le dé la gana? 8](P.176)*; *El detective se queda en su silla leyendo a los poetas latinos (p.181)* Horacio es uno de los poetas latinos de Roma. Estas líneas conectan entonces con la cita. La segunda encuentra conexión con el hombre negro que delira y agoniza, y menciona a *La República Soberana de Haití, la noche oscura del 21 de diciembre de 1816, sobre la libertad de los ciudadanos negros y de las nuevas provincias (p.116)* Para referirse a *la abolición de la esclavitud (p.117)*. Esta cita teniendo en cuenta que la obra se interesa en la vida de las comunidades negras de la Costa Pacífica colombiana, y lo que significó para ellos este hito.

La disposición es la siguiente: Citas textuales de Horacio y el artículo 14 de la Constitución de Haití de 1805; Capítulo Falla (P.11-P.60); Relato del pueblo negro (P.61- P.63); Capítulo Sedimento (P.67-P.129); Relato del pueblo negro

(P.131-P.132); Capítulo Temblor (P.135-P.200) Relato del pueblo negro (P.201-P.202). Al mismo tiempo, cada capítulo consta de una numeración interna entre corchetes, su función es introducir en diferentes escenarios: por ejemplo, en el capítulo *Falla*, 3] (p.20-27) hace referencia a la fábrica y sus socios; entre tanto, en 5] (p.36) del mismo capítulo habla del tío del Dr. en los tiempos de la violencia bipartidista en Colombia. En cuanto al narrador, y en palabras del mismo autor, es una voz que se deja intervenir por cientos de voces. *La voz era como si tuviera muchas voces* (p.190). Se perciben individuales y colectivas (los indígenas en la carretera). Se caracteriza por ser al mismo tiempo personaje, un personaje poroso. Esta obicuidad no le resta capacidad a las voces que va inoculando paulatinamente. Cuando menos piensa el lector se ha topado con más de diez voces. La particularidad es que no hay nombres propios: *tal como me cuesta a mí pronunciarlo, mi nombre y todos los demás nombres. No puedo decir nombres. Algo no me deja.* (p.127). Los personajes son identificables por su ocupación en la vida: El Dr. que al mismo tiempo es narrador, reconocible en la interacción que tiene con la recepcionista de la fábrica: *Me soríe y dice perdón, doctor, qué pena molestarlo* (p.23) y con la empleada de la casa: *¿se le ofrece algo Dr?* (p.70). El Dr. es *Un hombre después de los treinta y cinco ...Que se le pelan los cables* (p.39), que estuvo internado dos veces (p.47), *el heredero mediocre, el tipo que disfrutó de lo mejor desde el principio y jamás supo aprovechar las oportunidades* (p.41), quien *ve el mundo a través de fantasmas* (p.51) y *zombis* (p.60,174). Está en la *junta directiva* (p.72) de la fábrica. Con problemas de voluntad: *me dejo arrastrar a cualquier parte por cualquiera* (p.49); *me dejo convencer de las vendedoras* (p.81). Además, *estaba muy enfermo* (p.87) y *estar solo era lo que más miedo me daba* (p.88). *No quería a nadie... estaba como sembrado* (p.89). *Con gusto por las drogas* (p.90), *la coca* (p.93), *también tomaba pastillas* (p.93) que le mandaba la psiquiatra.

Entre las voces, *el vigilante* (p.18), un hombre negro sencillo y directo, desparpajado, hasta

ingenuo. *Los seis hombres o socios* (p.22), pertenecen a la junta directiva de la fábrica. *La recepcionista* (p.22) trabaja en la fábrica y pone al descubierto con su diálogo la ocupación del narrador. *La psiquiatra* (p.49), que en realidad es *una coleccionista impulsiva de antigüedades... Que ella misma restaura* (p.50). *Es el tipo de persona que se maneja bien haciendo varias cosas a la vez* (p.52). *El detective* (p.154) un *indio macizo* (p.159), médico yerbatero e informante *acostumbrado al peligro* (p.181). *La nana* (p.23) según la madre del Dr. *una ladrona* (p.54) pero también la mujer que él recuerda querer más que a su propia mamá, y protagonista del recuerdo que se intenta construir en la novela. *La fiscal, una mujer negra en sus cuarenta* (p.145). Por los lazos que los unen: *La mujer* (p.13) del Dr. quien no para en casa y está desconectada de la realidad de su marido. *La tía que en realidad es prima* (p.30), que es querendona y donde el Dr. puede descansar de sus oscuridades. El tío *Un asesino chiflado* (p.57) que *boleó machete en la época de la violencia* (p.58) que es incapaz de leer la Biblia porque le tiembla la mano. O por la descripción de sus rasgos, como *la muchacha de cara amargada...* (p.90) *ausente, los ojos vaciados y enmarcados por un pelo azabache* (p.90).

El detonante en Los estratos es el recuerdo impreciso (p.17) que el Dr. *asocia con la felicidad de la infancia: olor de aguas aceitosas, limo, residuos tóxicos, olor de mar apretado en una bahía sucia* (p.11); *soy un niño muy pequeño, de unos cinco o seis años* (p.29) con su nana en un puerto de la región del Pacífico en Colombia quien está interesado en reconstruir dicho recuerdo que aparece de manera insistente, lo habita y lo direcciona: *Y la cosa es que llevo un tiempo con un recuerdo que me viene a la cabeza. Un recuerdo del puerto* (p.38); *veo a mi nana, vamos ella y yo* (p.53) y *siento, que la nana me está llamando* (p.166). Al parecer lo agobia una terrible necesidad de *redención de los pecados* (p.55) propios y ajenos. Los temas subsidiarios que se desprenden de este son: el fracaso de su matrimonio. En este sentido su Mujer también tiene un particular interés en la infancia: *Ella pregunta por la finca en la que pasó su infancia, se refiere a lugares apacibles y*

bonitos con precisión. (p.68) pero cada uno lo asume a solas, pues enfrentan la inevitable decadencia de su relación: *luego nos vamos a la cama. Ojalá me convirtiera en un animal, digo. Pero ella ya no escucha. Hace rato que se ha dado la vuelta* (p.58). En otro momento, *entra mi mujer...Me voy dice. No le pregunto adónde* (p.70) y ella a su vez lapida sus intenciones: *ella dijo que yo estaba muy viejo para seguir estudiando* (p.99) *¿Tu mujer no te para bolas y por eso me llamaste?* (p.122) dice la psiquiatra; *mi mujer no me quiere, mi mujer no me quiere...Hablabla con su muerto. No quería hijos míos* (p.128). El tema de la enfermedad, muy arraigada en las entrañas; *su enfermedad y la mía ponían huevos* (p.97). Este se desarrolla de principio a fin y es por lo que mantiene en un estado permanente de “estar sin estar estando”. Es justo lo que necesita sanar el Dr. La debacle de *la fábrica* (p.25) con *el embargo de las cuentas...todo el proceso de deshaucio* (p.149). También el tema de la muerte desde diferentes ópticas: la natural *Hace ya tres meses que el esposo de mi tía murió en esta pieza* (p.35). La inducida: *compusieron un adorno floral con las partes, metiendo brazos y piernas en el agujero que había dejado la cabeza en el tronco* (p.37). La arraigada: *porque ya estaban muertos antes de que los mataran, y eran muertos vivos que mantenían viva la llama de la muerte en vida desde antes de haber nacido* (p.117). La histórica: *nojotro no noj puén asé ná porque ya tamo mueto y a lo mueto no loj toca sino el diablo y noay patrón que valga oyé* (p.131). La fabricada: *mataron al pajarito del billar* (p.169); por decisión: *es un muerto de los malos...Un muerto que no quiere saber que está muerto* (p.174).

También sobre el insomnio: *últimamente duermo mal y poco* (p.14). *Son más de la doce y no puedo dormir* (p.15); *desde hace un par de semanas el insomnio me arrastra hasta aquí* (p.16); *apenas he dormido dos horas...Siento los ojos como dos buñuelos fritos* (p.21); *no, le digo, llevo días con insomnio* (p.38); *mis ataques de insomnio* (p.175). Vivo como de *insomnio permanente* (p.137). El concepto del nuevo rico que construye la psiquiatra a partir de su ejercicio como restauradora; *se trata de jóvenes lagartos que*

pretenden parecer ricos (p.103) buscando el apellido de un terrateniente o la cercanía a los tiempos de la colonia con alguna línea de consanguinidad, y *que además mienten para alcanzar status* (p.104). El narcotráfico, evidente en las construcciones; *casi con toda seguridad el hotel es una tapadera para blanquear dinero negro. Una lavandería. El puerto está lleno de esta clase de negocios. Los narcos necesitan legalizar toda la plata que se genera aquí con los embarques de cocaína* (p.138). Los informantes o pajaritos: *el pajarito resulta ser un mecánico anciano, pálido y arrugado...El taller está en un barrio de calles sin pavimentar* (p.168). Dice el detective que es uno de ellos: *mis pajaritos y mis perros, somos los que encontramos las fosas difíciles, las que nadie quiere sapear. Somos informantes de ella* (p.176) de la fiscal. El ruido, *el ruido que sube de la calle es infernal* (p.155). Pero no se trata sólo del ruido producido por la música que viene de las casetas y las cantinas, es el ruido interior como un zumbido.

Asimismo, se interesa mucho por la realidad interior de los personajes (el estado de ánimo), el lenguaje que los identifica, y que inexorablemente los estratifica dentro de la sociedad mediante su accionar, los prejuicios, las costumbres, la crianza y los objetos materiales. Tal es el caso del vigilante con respecto al Dr, en el pasaje de la piscina (p.19). Mientras el vigilante es desbordado para hablar y es directo, expresa sus emociones: *la misma carcajada estridente* (p.20); y construye su ensueño de héroe bajo su uniforme: *y yo ta-ta- ta-ta gonorreas* (p.20). El Dr, se piensa y repiensa porque las apariencias han permeado su lenguaje al punto de sembrarlo, ya lo confirman sus estados de ánimo: *la respuesta sonámbula sale de mi boca* (p.25) y *no soy capaz de atender a lo que dicen los locutores* (p.26). Y *siento que mis ojos palpitan desde adentro* (p.28) Es la nana quien le ha enseñado a *reverenciar ese estado de ánimo.. Es el caldo oscuro* (p.30). O cuando está dominado por la enfermedad: *No quiero volver a mi casa...No quiero trabajar, no quiero hacer nada* (p.80), *cambio compulsivamente de canal...Me quedo mirando al techo* (p.86). A lo largo del relato expresa que *se sintió extrañamente feliz solo una*

vez (p.91) ¿Cómo desean quienes no poseen las cosas?, y, ¿cómo se comportan quienes las tienen? En esta línea, la presencia de la nana ayuda a clarificar el status del Dr. *mi nana cuando yo era niño* (p.23) y el de ella misma ¿Quiénes tienen nana? Y, ¿en qué puntos de la ciudad se asientan los que reciben el servicio como los que lo prestan? Como ocurre en la escena del chatarrero con el Dr y la psiquiatra cuando les ofrece *aguapanela...Y como adivina que le vamos a decir que no, se adelanta y nos sirve en vasos desechables* (p.106). También cuando se encuentran en la selva el detective y el Dr. *Y aunque en el fondo me inspira confianza es obvio que también le temo* (p.182).

Pasa también con los socios de la fábrica: *los diablitos hablan y echan chistes y se ríen exhibiendo sus prótesis dentales. Son unos diablitos viejos y de mal gusto, pero no dejan de ser unos diablitos. Hay que tratarlos con cuidado* (p.24). Un hombre negro del puerto o un indígena en la selva desde la obra no encaja en estas líneas. También, la manera en que los personajes enfrentan la vida y resuelven los conflictos, la actitud del Dr. frente a la noticia de la quiebra de la fábrica: *pero yo me pongo a pensar en la piel, en la corteza terrestre, rocas ígneas, rocas metamórficas, capa basáltica, capa granítica, rocas sedimentarias, lecho oceánico* (p.25) Incapaz de afrontar la realidad se contrae, escapa y entra en crisis existencial. Pasa con el tío de modo distinto: *escondía las manos para que no se le notara el temblor* (P.36) Mejor aún, *es raro que el tío no hubiera leído la biblia en su lecho de muerte* (p.40) Ocultando su situación real, el miedo a morir y ser castigado por la Divina Providencia a causa de su maldad. Cómo finge quién es, se desdobla, pues en realidad, era *un asesino chiflado... Con cara de buena persona* (p.57). Sucede también con el Dr. y la muchacha, lo que él llama, *la eclosión secreta de la enfermedad* (p.97), independientemente de dicha eclosión; de sacar respectivamente su instinto animal, las imágenes y los diálogos clarifican su lugar en el mundo. Él es un Dr. casado lleno de insatisfacción que vive en un buen sector de la ciudad, y ella una campesina que baila bien, con un pasado difícil. Y solo se trata de un rato huyendo de las reglas sociales.

En cuanto a los lugares donde se desarrolla la historia principal y las subsidiarias son tan variados como las voces: mar, bahía y ciudad (P.11); el pueblo (P.14); La casa modelo (P. 17); la piscina (P.19); la fábrica (P.21);el vertedero (P.21), la plaza (P.29); el muelle (P.30,108); la Galería (P.42); el bar (p.48); el río (P.50); el manicomio (P.47,87); El Sanandresito (p.80); sala de velaciones (p.83); la discoteca (p.89); el motel (p.94); El galpón de chatarra (106); El parque de atracciones River View Park (P.110); el sanatorio (P.137); las casetas (p.142); la selva (170); la bahía (p.175); plaza de mercado (p.182), entre otros. En esta misma línea el espacio o los espacios geográficos donde se desarrolla la trama de la novela, en principio no son explícitos, respecto a los nombres propios, pero con el paso de las páginas se van mostrando, primero con el acento de algunos de sus personajes, en voz de la Psiquiatra: *Vení* (p.49); *No tenés...y por eso hacés* (p.54); *¿Te imaginás?* (P.104); *no te burlés, que sos un ignorante y no tenés idea* (p.121) O cuando *la muchacha con cara de amargada* (p.90) dice: *apretame, quebrame, rompás* (p.96). Este acento pertenece a la región sur en el litoral Pacífico de Colombia (Valle del cauca cuya capital es Cali). También ayuda el periódico viejo encontrado detrás del espejo de un tocador para restaurar: *Correo del Cauca: Diario de la mañana. Fundado en 1903 por Ignacio Palau Cali, Colombia...1931* (P.56). Asimismo, el relato de los negros: *Vivíamos tuavía de cortar caña pal ingenio* (P.61) Los grandes ingenios azucareros quedan en esta zona del país. También cuando el Dr. está en la biblioteca, *busco libros sobre las tradiciones orales del litoral* (p.73), o cuando dice *crucé la Cordillera en poco menos de dos horas* (p.135) para llegar al Puerto es posible que se refiriera a la cordillera occidental. Además, en el capítulo Sedimento: *En sus paseos había jirones de niebla...Venados, ríos helados que bajaban de la cordillera, osos de anteojos* (p.68) se refiere a un piso térmico frío, un lugar sin nombre en la Cordillera, distinto de donde se mueven la mayor parte de los personajes. Aparte, es nombrado el eje cafetero por cuanto *la psiquiatra heredó una finca cafetera allá* (p.103). Y al finalizar la obra,

en el relato del pueblo negro es mencionado el *Puerto de Buenaventura* (p.201) y la ciudad de *Cali* (p.202).

Profundiza y genera inquietud haciendo uso de artilugios variados, como el trozo de periódico *viejo de los años 30* (p.53). Aquí queda la intriga: ¿qué dirá el diario?, ¿será real o inventado?, y lo mejor, da respuesta a la inquietud del lector (p.56). Al buscar en la Internet, en efecto el diario existió, cada nombre allí consignado, cada evento, ese ejemplar en concreto. También en una entrevista al autor confirma de la veracidad de esta información. Entonces es inevitable construir un poco del pasado, imaginarlo. Que el autor genere esas búsquedas en el lector es extraordinario. También insertando en diferentes puntos de la obra pasajes relacionados a los sueños, en este caso un sueño del Dr: *Sueño que voy a bordo de un barco...A la izquierda, cientos de casitas de madera paradas en altas estacas que se clavan en el lodo* (P.59); *me la pasaba soñando con el bosque* (p.87) Mejor aún, los tres relatos del pueblo negro en el lenguaje autóctono: *dotor, dejde, ejconder, paquel* (p.62), que presenta de corrido prescindiendo de signos de puntuación. Asimismo, la ficha biográfica del filósofo de *Belgrado del año 1946* (p.76) quien habla sobre folclor y oralidad popular, y que encuentra en la biblioteca mientras busca información del Diablito de Churupití ,y que además lo asocia con los tiempos de la Guerra fría y que habla *de un diablo que era el hazmerreír del barrio por su vestimenta* (p.76). Por otra parte, la referencia que hace de *la película de Samuráis* (p.88) que el Dr aprovecha para desdoblar sus emociones. Y el traer a colación al *diario liberal El Relator de 1931* (p.98); la imagen del lobo que *no está hecho para el arrepentimiento* (p.98) y *el afiche de un futbolista negro* (p.113) que encarna la esperanza de libertad del pueblo negro y que muy posiblemente sea Pelé.

La inserción de pequeñas denuncias que abarcan grandes problemas institucionales y humanos, distribuidas a lo largo de los capítulos conducen a reconocerlos en carencias y/o desperdicio, como cuando hace referencia a *las ruinas de la antigua Normal de Varones... El edificio es enorme, de*

tres pisos con las paredes descascaradas y verdosas por la humedad (P.16) También, cuando el Dr. se enfrenta a las propias inconsistencias *Entro a la pieza de la empleada del servicio, cosa que nunca hago en nuestra casa. Es una pieza enana, demasiado enana, donde apenas hay sitio para la cama, un armario... Asfixiante incluso estando vacía* (p.17). En la misma dirección, la experiencia del vigilante en el conjunto residencial es más profunda todavía: *se recuesta contra una reja y mira hacia la piscina con aire soñador y pícaro. Qué bonita el agua...Le juro que con este calor me metería a bañarme. Me metería así nomás...Una chimba de piscina, dice. Lástima que nosotros no podamos usarla.* Imágenes estas últimas que dejan bien establecida la estratificación social, quiénes tienen comodidades. Lo que atañe al vertedero *Un cartel anuncia que se trata de un vertedero temporal. El cartel lleva allí cinco años* (P.21). También cuando la tía que es prima asegura que *las gallinas tampoco son como antes ...porque el maíz es malo y como las gallinas son malas el sancocho tampoco sale bueno y que por eso las cosas estén todas tan mal* (p.33) Otra forma de denuncia es expresada a través del arte: *Una montaña de piedras. Cada piedra envuelta en un papel* (p.43) *son cartas escritas por los indígenas de una comunidad muy afectada por la violencia* (p.44) Se refiere a las manifestaciones de los pueblos indígenas al sur del país por el respeto de su territorio y *el cumplimiento de sus derechos* (p.121). Como forma de protesta *arman cambuches y gente cocinando en fogatas pequeñas, muchos niños...La alcaldía los mandó sacar* (p.161) Asimismo, respecto a la catástrofe creada por el invierno: *dicen que hay gente desaparecida...Pero no leen los nombres de la gente desaparecida...En cambio repiten la lista de los pueblos...y declaraciones del ministro, del gobernador* (p.72). O cuando afirma que *las alcantarillas se desbordan* (p.72) común denominador del sistema de alcantarillado en Colombia.

Son increíbles los efectos que el escritor logra en el lector, en este punto fue inevitable recordar la catástrofe de Armero, el pueblo de Colombia que

desapareció en 1985, por esta línea *la gente en los tejados esperando a que llegue ayuda* (p.73). Otra imagen muy contundente que es denuncia también: allá en la casita de madera *El lamento de una voz humana...Es una masa informe, negra y llena de úlceras entre las cuales se distinguen... Algunos dientes, la lengua amoratada* (p.115). La agonía de la gente en los territorios; y las consecuencias nefastas de pertenecer al nivel más inferior de la escala social: *uno bañándose en pissina de rico aunque sea mueto pobresita mi sobrina se quedó sin trabajo porque nojotro teníamos mucho caló...Casi se la comen viva* (p.132). Además, la realidad del detective: *los indios somos pobres y no tenemos apenas nada...Andamos con lo justo...Una hamaca, un machete, unas botas, un calendario viejo* (p.160). Y cuando el detective llega a uno de los caseríos y le dicen: *llevo días con un dolor aquí, vea, como si me clavarán una puntilla caliente* (p.184) Le dicen *Doctor en la comunidad negra* (p.184). La ausencia del estado es evidente también en temas como: *acá nadie sabe de papeleos ni de notaría...yo me ofrecía a ayudarles para que cada vez que vinieran con la hostigadera y a amenazar con sacarnos de acá pudiéramos mostrar los papeles* (p.188).

Pasajes que son un misterio como cuando la nana *está triste y su tristeza, tan poco habitual, encierra para mí un secreto profundo* (p.29) Pero no dice el secreto, no de inmediato. En esta misma línea: *El enfermero describía el paisaje tan bien que despertaba en mí el deseo de acompañarlo* (p.67) *...Nunca lo hizo pero sufrí cuando dejó de trabajar allí* (p.68); *Sonaba con el oso de anteojos. Nunca pude pasear por el bosque* (p.87)... *Me hubiera gustado ...descubrir...Un arroyito de aguas frescas que saben a sombra* (p.88). El autor tiene al lector a punta de insinuaciones, imágenes, pero no confirma nada, entonces pone al lector a volar con la imaginación. Creo que entre todos los pasajes este es el más contundente: *Lo importante es el lugar, el espacio donde transcurre. Es una especie de cañaveral junto a una ciénaga...Todo está húmedo, sucio. Casi se huele. El viento se frota contra las cañas. Viento, cañas, viento...Lo importante de verdad...es como se frotan viento*

y cañas... Se soban, se lamen, se restriegan y bailan y toda esa frotación es lo que no se me olvida (p.88,89) este da luces de lo que sucede al interior del Dr. del por qué de su oscuridad. Es inevitable pensar por un lado en El sobrino de Wittgenstein de Thomas Bernhard en torno al tema de la enfermedad: *el enfermo que vuelve a casa no espera más que consideración, y no encuentra en fin de cuentas más que una brutal hipocresía* (p.71). Y en El inmoralista de Gide cuando dice: *Ninguno ha sabido enfermar...Me sentía extraño entre los demás, como quien vuelve de entre los muertos* (p.102) ... *Yo arrastraba un aburrimiento sin nombre* (p.150). *El recuerdo es una invención desdichada* (p.160) Son justamente los recuerdos los que tienen sembrado al Dr. Es muy curioso como Gide y Juan Cárdenas evocan diferentes clases de árboles que ayudan a construir una atmósfera particular, con los Almendros que contribuyen en la construcción de los estados de ánimo en los personajes. Otro evento misterioso tiene lugar en un hotel donde *la nana pregunta... por alguien y le piden que se vaya, que la persona que busca no va a regresar* (p.108) Y cuando entre el Dr. y el detective *Me quedo perplejo mirándole el rostro...Que me resulta siniestro y hermoso* (p.162).

Es inevitable experimentar unos parones, el ritmo sostenido se rompe, en el sentido de que la velocidad de lectura cambia a causa de algunas escenas que tienen un carácter desbordado que afecta las emociones del lector, tal es el caso en el capítulo *Falla* sección 5] (P.36,37) *“Un día hablé de la primera vez que le tocó descuartizar a un hombre... Primero un brazo, luego el otro y así, dejando la cabeza para el final”* Aquí por la crudeza del relato. También, pero generando una emoción distinta, cuando finaliza el capítulo *Falla* y se abre al lector el relato corto en lenguaje popular muy tropical (P.61) *“Después de tanto tiempo y que te escriba precisamente a vos ya no sé como tratarte porque a fuerza de tanto entrar y salir de vos ya no sé si eras mi perro mi esposa mi dueño no importa mi amor un vaso de Coca-cola bien fría”* En estas líneas no se aclara explícitamente el tipo de relación, pero si genera suspicacias, especulaciones. Obliga a repasar el

pasaje una y otra vez para atar los cabos. Otra escena inquietante se relaciona con el sueño del empalamiento en el capítulo *Temblor* sección 7] (p.170) “Y lo empalábamos vivo. Le metíamos una guadua por el culo y se la sacábamos por la boca. Les dábamos a elegir: o aceptaban nuestras reglas o les pasaba lo mismo. También, en el mismo capítulo la sección 12] (p.188). El nivel de violencia en ese acto inhumano deja al lector sumido en el silencio. También, con respecto a la nana: “Era mi mamá... Tenía un fajo de billetes. Yo me asusté y le pregunté de dónde había sacado esos, le juro que yo había visto tanta plata junta en la vida” o cuando la Psiquiatra le dice al Dr. que tiene una amiga en la fiscalía que busca gente desaparecida 5](P102). Son escenas que generan un cruce de emociones que necesitan tiempo para ser gestionadas, además reflexionar sobre el entorno que habitamos y las cosas que suceden.

Respecto a la atmósfera en el segundo capítulo Sedimento, la lluvia es una condición casi permanente: *Llueve* (p.72). *Tenemos diluvio... Todo el año* (p.197) y es evidente en los mensajes que se escuchan de la radio informando sobre las catástrofes producidas al parecer por el fenómeno de la niña. La lluvia es insistente: *parece que lleváramos meses así, con este clima infame* (p.129). Pero también cambia con la temperatura en el episodio sexual con la muchacha de cara amargada: *te gusta que te rompan, te gusta, puta, y ella que sí, que le gustaba que la rompieran* (p.96); En el otro extremo las condiciones de miseria en que habitan: *llegamos a un barrio junto a un manglar sucio, el agua llena de basura flotante y el olor a mierda, las casas sobre pilares de madera clavados en el barro, no hay luz eléctrica* (p.112)...*Se alumbran con luz de velas...Un afiche de un futbolista negro...Un chinchorro y una atarraya* (p.113). Así como la relacionada con al hambre que pasan estas gentes: *Comé despacito. Agua molida y viento raspado, lo que comen ahí afuera los que no tienen que comer* (p.113). Sin embargo, hay una atmósfera que es imperturbable hasta el final y es la que carga consigo el Dr. el aburrimiento, el zumbido, la inconformidad, el desasosiego, la enfermedad, todo lo asociado con la ausencia de luz, de claridad en las ideas, en las acciones.

En el caso de la selva, la atmósfera es parecida a la obra *La vorágine* (p.35). Que además es uno de los referentes del autor desde dos perspectivas: él ha sido permeado por la escritura de José Eustasio Rivera, hecho evidente en la obra *Los estratos*, cuando la selva es nombrada y enaltecida junto con todos los misterios que entraña, respecto a la natura y sus habitantes, y las relaciones que se establecen entre sí. Por otro lado, en lo que atañe a la obra en estudio cuando el personaje, el tío del Dr. en su lecho de muerte en lugar de la Biblia usa el libro de la *Vorágine* para llenarlo de anotaciones específicas del calvario que llevaba por dentro, evidente en frases como: *inclinaba la cabeza sobre el pecho para escuchar un tenaz gorgojo que le iba carcomiendo el corazón* (p.40) Que constituyen alrededor suyo una atmósfera sanguinaria. También todo lo opuesto, líneas cargadas de humor que resultan del encuentro sexual entre el Dr. (narrador) y la muchacha con cara de amargada en el hotel que había sido de los narcos: *La pieza que nos dieron tenía alfombra, ventiladores de aspas azules, un televisor viejo con recubrimiento de fórmica. La verdad es que era como para salir corriendo* (P.95) ... *Ella follaba como si fuera a morir al día siguiente* (P.95) ... *Me echaba todo su subdesarrollo en la cara* (P.96).

La importancia de la cultura negra en la obra. En la primera escena es una mujer negra, la nana, el detonante de la historia, como una forma de reivindicar su labor. Aunque se han relacionado íntima y dolorosamente con la muerte desde tiempos ancestrales. Ellos sonríen y cantan al dolor, *en las historias clásicas de negros hay un diablo jugueteón dueño de los secretos del baile y del canto* (p76) y desde las leyendas populares: *el diablito de Churupití* (p.23) *La viuda, La tunda y La gualgura* (P.74) que forman parte de su idiosincrasia. Se caracterizan por una sonrisa nítida como la del hijo mayor de la tía que en realidad es prima: *sonríe con todos los dientes y se me acerca ... empezó de muy abajo y ha conseguido lo que deseaba gracias al esfuerzo y talento individual* (p.41). Por otro lado, en la obra, el papel del diablo es importante, forma

parte de su tradición oral, cuando relaciona a Lucifer como *el inventor del buen gusto...El que hace que los negros se quieran parecer a los blancos* (p.78). Esta población ha tenido que asumir la vida desde otra óptica, no como es para la mayoría, sino desde los espacios que han venido ganando con el tiempo y que se reflejan en el arte, como en el bus que van la nana y el Dr. cuando era niño: están *Adán y Eva comiéndose una papaya* (p.109) en lugar de la manzana, acondicionan el arte a sus dinámicas sociales. *El parque de diversiones* (p.110) recoge las necesidades y anhelos de una comunidad que difícilmente puede salir de allí. Y es el espacio donde pueden ser héroes. De este modo, el Dr entiende que *mediante la música esta gente habla de amor para no decir mierda, habla de amor para no decir hambre, habla de amor para no decir puta vida, mi casa se hunde, no tengo trabajo, no tengo en qué caerme muerto* (p.155) y que pese a la dureza de la vida la gente: *no se queja, ni pide lástima. Sólo necesita contarle* (p.187), además de tener como idea rectora: *Uno tiene que ser agradecido y responder por la gente de uno* (p.190). *El plátano frito con café* (p.199) no les ha cambiado el corazón.

Aborda temas de la historia de Colombia que han marcado al país de diferentes maneras, *El tío había militado en el Partido Conservador durante La Violencia...Yo creo que se hizo chulavita* (p.36) Entre los años 40 y 50 del siglo XX La Violencia Bipartidista, fue caldo de cultivo para la formación de las guerrillas y los grupos paramilitares. También todas las expresiones de violencia que han tocado a la comunidad negra durante y desde la abolición de la esclavitud en Haití, y lo que esto significó para la liberación de las nuevas provincias. Nombra, además, *La guerra de los mil días* (p.118), producto de los conflictos entre los partidos políticos tradicionales de Colombia a finales del siglo XIX e inicios del S.XX. Asimismo, el paramilitarismo: *en una calle vacía se me acercan dos tipos subidos en una moto...El parrillero... Se baja de la moto...No son policías. Mientras revisa mi documento...Qué hago a esa hora en la calle, dónde me hospedo, cuántos días llevo en el puerto, de dónde vengo.* (p.157). Es una imagen

muy vívida esta. La superstición y la tradición oral del litoral, en el caso de la obra ofrece un remedio para curar: *La mamá lo llevó a ver a un brujo que le puso un amuleto y le echó un rezo de protección para que no se lo volviera a llevar ningún espanto* (P.75). La idea del Remedio es *santo para encontrar a la gente que se pierde. El remedio es el remedio* (p.177). En la visita que hace el detective, que es un indio, y es reverenciado como Doctor en la comunidad negra, Una bruja *...lo invita a tomar tinto y trata de echarle una maldición* (p.185). Dice el detective, *la enemistad es por la clientela*.

El texto es habitado por las recetas culinarias propias de la Región Pacífica, en el capítulo *Falla La receta de la chicha* 5] (P.33) *Agarro el maíz cocido, dice, lo muelo bien molido, le echo la panela y cáscaras de piña... En una olla de barro y esa olla se entierra varios días en el patio para que fermente*. Luego, en el capítulo *Temblor*, La receta de los tamales de Piangua 1] (P.143) cuyos ingredientes son: *Las hojas de plátano... La masa de maíz...El guiso de piangua...Leche de coco...Poleo, albahaca y el cilantro cimarrón*. También incluye dentro de las parlamentos alimentos típicos también del litoral: *las arepas* (P.39); *La aguapanela* (P.106); *El pescado frito y los mariscos*; *El encocado de jaiba, arroz endiablado, tamales de piangua* (P.143); *la cerveza* (p.48,139); *la guagua*(p.146); *arroz frito* (p.157).

Entre otros recursos que usa el autor para enriquecer el proceso de escritura, se vale de la repetición consecutiva: *si se me permite decirlo así. Si se me permite decirlo de algún modo* (p.12); *Siento terror. Terror estúpido* (p.23); *que todavía no tiene, que no tiene* (p.53); *Adiós, adiós a todo esto. Adiós a todos. Adiós* (p.196). Y de la insistencia con frases sencillas en diferentes estadios de la obra como: *van a lavarse las manos en la pila con el jabón azul de lavar la ropa* (p.34); *Tiene la piel...olorosa al jabón azul de lavar la ropa* (p.38). También de la contracción de palabras en lo relatos de los negros: *pordió, nojíbamo* (p.131). En la forma de comunicación de los informantes usando los perros: YUCC JZGZB, HTZYCUBZGJ. Con el uso de imágenes contundentes: *casas de madera*

paradas sobre largas estacas que se clavan en el lodo (p.109). Con descripciones que evocan algo un poco familiar pero que no se puede definir con certeza: *en medio de la placita, junto a un árbol enorme y frondoso de hojas anchas, el tronco gruesísimo* (p.84) Pareciera que se refiriera a una Ceiba pues en buena parte de las plazas de los pueblos de Colombia hay Ceibas. Y el protagonismo de los árboles cipreses (p.16). La inclusión de propaganda de productos que salen en la radio o en la televisión: *CONSUMIR CAFÉ es proteger la economía nacional; Un vaso de Coca-Cola bien fría es un deleite al paladar* (p.69). Prescindir del guión o rayuela de la narrativa que hacen más identificables a los personajes y sus acciones. En este caso, el lector ha de estar atento sobre el cambio de la voz y su papel en la obra. En el mismo sentido, introduce palabras que en su significado son muy parecidas y se asocian a la oscuridad así: *sombra, oscurece, no hay luz, tinieblas* (p.12); *miedo, terror* (p.23), *encierro* (p.81) creando una atmósfera como desahuciada. Palabras en lenguaje popular: *pailas* (p.18); *chimba, bacano* (p.19); *gonorreas* (p.20); *cabuya* (p.43). Líneas de palabras que rompen la estructura gramatical: *PrUeVEsUZuERteCoNe LANimAlItto. Sinco PeSos* (p.62); *placutucuplá-cuplá* (p.118). Términos en apariencia inconexos: *General Esto y lo Otro de Más Acá* (p.117); *que te voy a contar cómo fue cómo fue cómo fue cómo* (p.118), voz esta del hombre negro que delira (p.115). La repetición de adverbios: quizás vengan, quizás sean; quizás ella (p.140). Repetición de palabras específicas: la onomatopeya *Zumbido* (p.182), pues hay una clara obsesión por la selva. *La selva que zumba* (p.186). Los dichos populares: *Hay que mirar siempre para adelante... Para atrás ni para coger impulso* (p.93); *Agua molida y viento raspado* (p.113). El nombre de instrumentos musicales propios de la región: *bombos y cununos* (p.74) y *los acordeones* (p.151). La inserción de verbos como: *Despescueznarizorejar* y sus respectivas derivaciones, *Despescueznarizorejados*, *Despescueznarizorejamiento* (P.97), para referirse también a la eclosión secreta de la enfermedad. Términos geográficos: *Manglar* (P.175); *Estuario* (P.179); *Bahía* (p.175); *La corteza terrestre, rocas ígneas, rocas metamórficas, capa basáltica, capa*

granítica, rocas sedimentarias, lecho oceánico (p.25); *el fenómeno de la niña* (p.144). Fauna: *tucanes, monos aulladores* (p.181); *el oso de anteojos*; la rana y flora de la región: *cipreses; acacias, almendros, guayacanes* (p.20). Nombra *La música disco, el estacato* (111). Con la descripción de los lugares (el muelle), *camina por una calle sucia y oscura con hoteles y restaurantes de mala muerte. Hay un billar, varias cantinas ... Mujeres negras y hombres negros y ropa de colores chillones* (p.108). Es una imagen impresionante de la situación de esta población allí en el muelle. Igualmente, la descripción de eventos que determinan fenómenos como el clima: el Dr. visita a su tía que en realidad es prima *En su casa siempre hay alguien en el antejardín tomando el fresco y viendo pasar gente desde una silla, a la sombra de un guamo... Y lo único que se escucha es el ventilador de la cocina* (p.30) esta actividad es habitual en todos los pueblos de tierra caliente de Colombia, además, la guama es una planta propia de este clima. El pasaje de la tía que es prima es contundente en este sentido; se sientan en la calle a tomar el fresco, preparan chicha, cocinan en compañía de otras mujeres, el ruido de la nevera, la cercanía. *El aire vaporizado y caliente* (p.125).

Se desprende de cada pasaje una necesidad imperiosa de silencio, introspección y visitar la memoria individual y colectiva; nadie pasa imperturbable; esta capacidad que produce el autor es asombrosa; como sucede con la escena del hombre que se lanza del puente, *al río crecido con olor a podredumbre* (p.101), invaden la memoria todos los ríos conocidos con esta característica. Sentimiento que produce también, el contacto con la selva mediante la palabra escrita. Por alguna razón la selva nunca se apartó de mí, quizás nunca como aquel día, lejos de todo lo conocido, lo aparentemente seguro *La selva lo envuelve todo con su ardor y sus voces* (p.195). Por último, respecto a la época o tiempo del relato. En el capítulo Temblor 8] (p.176). El Dr menciona una fecha *Martes, 20 de enero* (p.176) y parece que la novela se desarrolla en la segunda mitad del siglo XX.

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A Critical Analysis of Outcome based Education

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Outcome-Based Education (OBE) means emphasizing on results. OBE practitioners begin by determining the knowledge, competencies, skills and abilities that they want students to demonstrate as and when they complete their schooling and confront the challenges of the real world. OBE is a way of designing, delivering and documenting instructions in order to achieve desired goals and outcome. During 1980s Americans reported that schools were in a serious trouble and many children were not being able to learn. In reality, the fresh mind and the eagerness to learn in children makes them look and learn as much as possible.

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A Critical Analysis of Outcome based Education

Dr. Sukanta Kumar Naskar^α & Dr. Rita Karmakar^σ

ABSTRACT

Outcome-Based Education (OBE) means emphasizing on results. OBE practitioners begin by determining the knowledge, competencies, skills and abilities that they want students to demonstrate as and when they complete their schooling and confront the challenges of the real world. OBE is a way of designing, delivering and documenting instructions in order to achieve desired goals and outcome. During 1980s Americans reported that schools were in a serious trouble and many children were not being able to learn. In reality, the fresh mind and the eagerness to learn in children makes them look and learn as much as possible. They learn how to talk, walk, ride bicycles, and make a bond with parents and teachers and so much more. Academic institutions are solely responsible for designing curriculum for children. Numerous studies reported that schools are not being able to implement curriculum and the obvious resolution to that problem is educational restructuring which is broadly known as “Outcome Based Education” (OBE). The present research article is an attempt to analyse critically the “Outcome Based Education” (OBE) and try to introduce an alternative to OBE, which is THE PROCEDURAL-INQUIRY MODEL.

Keywords: educational restructuring, learner-centred classroom, outcome based education, procedural-inquiry model, teaching and learning.

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I. INTRODUCTION

“Education is a process, not a product” wrote Jerome Bruner 30 years ago. Education is a social-reflexive process that must be negotiated in

classrooms on a daily basis. No amount of “teacher-proof” curricula, tables of specifications, scope and sequence charts, or lists of objectives can change these facts. The first and foremost aim of teaching and learning is to establish a cordial relationship between teacher and student. The word *education* comes from the Latin *educare*, meaning *to rear*, just as a mother rears her children. Rearing in this sense connotes loving and caring. It is not some form of engineering one in particular directions. It is artistic and creative, because the student thinks and creates meaning. Learning is a form of “meaning making. *It is not the goal of teaching to produce results, but to create an experience in which the student can arrive at creative encounters, be drawn out, and make meaning.* Curriculum is not a thing to be “covered” by teachers; it is meant to create occasions in which learning takes place.

Can a rational alternative to OBE be developed? Criticizing this model without suggesting a suitable alternative vision for curriculum and instruction is inappropriate. The purpose is not only to critique with a view of inviting experimental testing that would lead to refutation or refinement, but also to posit an alternative “procedural-inquiry” model of education. Thus the critical analysis of OBE is required.

In contend that curriculum and instruction can be effectively organized by a logic other than the “technical-rational planning” of outcomes. Clearly, OBE is a “means-ends” model of curriculum planning, based on what Spady describes as essentially a “design” for learning. According to Spady (1994) following are the basic principles of OBE:

- Student-centric- The approach centres around students and focuses on skill acquisition.
- Clarity in focus – This approach focuses on the specific outcomes of the learners.

- Design down, deliver up: The objectives and the expected outcomes must be clearly outlined and thereby facilitating the performance of students.
- Exceeding expectations – The self-efficacy of students may be enhanced in order to facilitate their performance.
- Expanded opportunities – Students may be given several chances in order to meet learning objectives and the principle of individual differences (every learner is unique) must be incorporated.

Outcomes-Based Education (OBE) means Emphasizing on the goal. OBE is a clear shift from teacher centric education to student centric education and it expects students to develop knowledge, competencies, and qualities as and when they finish schools and face the challenges in the external world. OBE is a unique way of designing and delivering instructions in order to achieve intended goals and outcomes.

Another supporter of OBE has argued that in a Learner-centred classroom, the focus is on the outcomes and not on the methods and materials.

Daggett, also a supporter of OBE, Viewed OBE as a “training-instructional” model that views schools as vocational skills dissemination centres and not educational environment.

It may be useful to clarify terms and distinguish among types of “education”. *Training* is concerned with such student performances as making a picture frame, typing a letter on a word processor, kicking a field goal, and so on. *Instruction* hints at retention of information-for example, knowing the names of the states and their capitals. Finally *induction into knowledge* results in human understanding. I use “induction into knowledge and understanding” synonymously with “education,” for it represents initiation into culture and worthwhile episodes of learning.

The major limitations of OBE are that it is not equally relevant in different planning models for different areas of the curriculum development. For example, OBE may be highly suitable for teaching technical writing skills; but the teaching

of art or English literature does not take the form of a step-by-step progression towards outcomes. I would argue that models such as mastery learning or outcomes-based education can function at the levels of training and instruction, but they contradict the idea of education as induction into knowledge. As Stenhouse so eloquently argued, “Education as induction into knowledge is successful to the extent that it makes the behavioral outcomes of the student *unpredictable*.” *If our aim is to get pupils to use knowledge creatively, then it is nonsensical to try to define specific behaviours that will result from education. The crucial thing about knowledge is that we think with it. How can I, as a teacher of English literature, define what a student will have as an outcome from reading Paradise Lost?*

Claims that OBE can be applied to the entire curriculum presuppose those objectives are appropriate for all subjects, at all levels of education. Teachers and theorists in the arts and humanities in particular have countered that in these fields the concern is not for the students to reach goals or exit outcomes once and for all, but rather for them to develop standards of judgement, criticism, and taste.

Spady and Marshall couch their arguments for OBE in a “success for all” vision. They contend that OBE rests on three basic premises:

- All students can learn and succeed (but not at the same rate).
- Success in school breeds further success.
- Schools control the conditions of success.

Well, this may be true for some pupils and some subjects. But perhaps this theory needs refinement-or even rejection. The idea of significant, observable educational outcomes and the notion of curriculum as preparation for adult life is not new; the “objectives model” formulated by educators such as Franklin Bobbitt and Ralph Tyler exalted the instructional objective.

II. OBJECTIONS TO OUTCOMES BASED EDUCATION

The most fundamental criticism against OBE is that it reduces educations, teaching, and learning

the forms of human engineering and quasi-scientific planning procedures-procedures that view education as an instrumental means to specified ends. This model, educators may find unacceptable, amounts to molding students through behaviour modification. It resembles the activity analyses of human behaviour discerned by Bobbitt 75 years ago.

To treat knowledge as instrumental is to dismiss a most important possibility: that the justification for education lies within the process itself. The pupil who has been truly educated may lead us into unexplored meanings and outcomes, into unanticipated and unpredictable directions. Imagine a student of *Macbeth* purchasing a text that includes all the possible interpretations and understanding of that play. If we teachers possessed all the answers, we could publish such a text-surely an absurd scenario. The educated mind will always achieve unique and novel interpretations because knowledge is a tool to think with. To cite the significant outcomes in advance of teaching and learning is absurd.

A second objection to OBE relates to its assumption that knowledge and curriculum content can be sequentially broken down into "micro-outcomes" that eventually lead to more significant "exit outcomes". Such a view of knowledge disregards the epistemology of knowledge. The translation of the deep understanding can never be reduced to behaviours, lists of skills, and observable performances. Knowledge is an open-ended inquiry, neither a product nor an outcome. Adapting OBE is trivializing knowledge by reducing objective facts.

A related problem is the implication that there are systematic hierarchies of objectives, beginning with lessons and continuing through units, courses, programs, and, indeed, the entire educational career of the student. This linear, step-by-step view is a little too tidy for most learning that goes on in schools. In most of the cases, knowledge and understanding and affect go hand-in-hand. True learning, like excellent teaching, is more arguably developmental and not linear.

Thirdly, while OBE may improve the structure of lessons and units within courses, it does not necessarily improve the quality of curriculum there is serious dearth of empirical evidences suggesting that OBE functions more effectively than a process model. No evidence suggests that this is now pupil's best learn or understand their educational experiences. If 90 per cent of our students attain honours grades in trivial pursuits and experiences, curriculum and learning are not advanced. Moreover, teachers, policy makers, and others with an educational stake do not have a tradition of teaching or planning in this outcomes-directed way.

A fourth objection relates to the tendency for outcomes to be expressed as simple "recall" or "learning" objectives, often because these are easiest to assess. This tendency helps explain the enormous derive toward centralized state assessment procedures. In fact, OBE is characterized by state prescriptions of student outcomes measurably by external testing. This characteristic diminishes the professionalism of teachers by reducing their involvement in research and assessment activities.

Stating outcomes as a comprehensive form of intellectual scaffolding limits inquiry and speculation and gives schools and curriculum framers unwarranted authority and power over knowledge and understanding. One could argue that it is arrogant to suggest that outcomes, as expressed in paper and pencil assessments or examinations, define knowledge of a field, or of a student. More often assessments or examination determine what the student has not learned. Knowledge has more in common with speculation than with mastery. To define education as set of outcomes decided in advance of teaching and learning conflicts with the wonderful, unpredictable voyages of exploration that characterize learning through discovery and inquiry. In addition, many significant outcomes may express themselves only over the long run or in the fact of particular contingencies. For example, I worked on the construction of a cultural studies programme in Northern Ireland that aimed at encouraging "mutual understanding and tolerance in intergroup relations". Such a

significant and important goal cannot be realized (or assessed in a unit or term), but may take many years to manifest itself.

Fifth, a linear OBE model is non-reflexive-it does not examine itself. It specifies the limits of the field of study and suggests that there cannot be more education than is encompassed by the stated outcomes. In this sense it is really a ‘minimalist’ instruction model, and furthermore, it implies a poverty-stricken model of student-teacher uncomfortable close to playing the role of indoctrinator. Indeed, one could argue that it is undemocratic to dictate the ends of learning in advance of teaching and learning. Education requires inquiry, and we cannot predict the ends of pure inquiry. “How can you put on the blackboard the mysterious internal goal of each creative person?”

This is not to say that we should not have an aim, or outcome. To teach without a goal would be irrational. But OBE carries much of the baggage of behaviouristic psychology applied to schooling and curriculum. Its basic argument suggests that education should be about planning behavioural changes in students’ performances. It further brazenly argues that all of the significant

outcomes can be specified in advance. Moreover, it implies that all pupils should demonstrate similar outcomes and behaviours. I must ask, is education about some standard packaging of outcomes as products, or is it more akin to a reflective social process?

III. AN ALTERNATIVE: THE PROCEDURAL-INQUIRY MODEL

As indicated above, the outcome-based approach may be satisfactory for areas of training, demonstration, and low-level skill required in vocational courses; but it clearly breaks down in this sphere where knowledge is used to produce meaning.

In certain areas of the curriculum-those focusing upon knowledge and understanding-an alternative to OBE, which may be called “procedural-inquiry model,” is more appropriate. The great advantage of the procedural model is that it rests ultimately on the strength of the teacher. Characteristics of the OBE and procedural-inquiry models are appended in table 1.

Table 1: Salient feature of OBE and Procedural-Inquiry Model of Education

OBE	Procedural-Inquiry Model
Outcome driven. More extrinsic in nature	Understanding and knowledge driven, more intrinsic in nature
Teaching and content are selected in order to attain pre-determined objectives	Key concepts of teaching and enquiry methods are emphasized
Standard of student performance represents goals and objectives	Selection of methods and concepts are based on the criteria and procedure
Goals and objectives are the bases of content selection	Unit method not necessary
Teaching materials and units follow a logical sequence	Teaching is a reflective social process
Curriculum divided into micro units	Instructional training orientation
Teaching instruction aims at specific goals and objectives	Emphasizing on creativity, assertiveness, and quality of experience
Emphasis on convergence	Emphasis on divergence

Teacher adjusts Time based on learner's aptitude	Complex evaluation by teacher
Assessments and evaluations are based on objective tests	Assessments are judgmental and interpretive in nature

The procedural-inquiry model starts not with the specification of ends or outcomes, but with the principles of procedure for doing inquiry in a particular field or form of knowledge. It does not presuppose some lockstep, linear progression through a continuum of goals from the level of lesson on through unit, course, programme, and finally, national agenda. It is about teaching through inquiry, and evaluating teaching and learning through teacher classroom research and thereby leads to self-development of a teacher.

The procedural-inquiry model has three parts: (1) a broad aim, (2) principles of procedure, and (3) criteria for assessing student work.

The broad aim of the procedural-inquiry model is to advance understanding of social situations and controversial issues and the human and moral values thrown by these issues. The principles of procedure are as follows:

- Discussion is the best teaching strategy for enhancing understanding.
- The teacher remains “neutral” on moral value issues.
- The teacher adopts a facilitator role and “chairs” the discussion to ensure continuity, summary, and access to evidence.

The following criteria are used for assessing student work:

- The extent to which students to use knowledge and concepts to explore issues. For example, in discussions, the students might be asked to use the concept of role to compare the situations of men and women. A subsequent examination might ask the students to define “role” and use the concept in discussing relations and gender.
- Extent to which a student can understand wide of range of views of an issue of different perspectives associated with a view. For

example, a discussion in which students consider many different points of view on marriage might lead to an examination in which students are asked to give to accounts on alternative forms of marriages.

Procedural-inquiry model pose as an alternative to OBE. Procedural-inquiry model, a rational planning model for curriculum which is based on the “principles of procedure” in a particular field or form of knowledge.

By employing the principles of procedure teachers adopt a research, or inquiry, stance towards teaching, which asks for self-evaluation of professional development and judgement. Our curriculum design aims at advanced understanding of key concepts in social studies. It attempts to use key concepts in question and tries to identify the criteria of judging the performance. It also specifies the procedures to be followed by teachers and students in the educational activities. Content may be selected to illustrate the best procedures, concepts, and criteria. In a fundamental sense, the teaching processes and principles become the “objectives” or outcomes. It is thus very much a pedagogical model to test teaching and learning. A style of pedagogy that adopts action research or action inquiry-studied enactment can provide a basis for the teacher to reconceptualise OBE into a theory of processional self-development, because the teacher’s ideas are integral to professional and practical competence.

American educators have been denied what Europeans have called “pastoral care” in curriculum: systematic schemes whereby tutors take on a special role of caring for children and their learning. Another feature of teaching and learning suggests that they cannot be directed at specific objectives. To learn one must be *free to learn*-not constrained by plans and objectives and various other obstacles. If the student is to have the freedom to learn, then teaching cannot be

constantly directed towards various objectives. The technical OBE stance devalues professional judgement by not focusing upon the process of education but instead highlighting the ends or outcomes.

Other than this “procedural principle, a second argument supports the notion of placing teachers in charge of assessment and evaluation: the teachers-as-inquirer is truly in charge of the classroom and is managing the learners and the learning. Besides, classrooms are ideal laboratories for doing research that will enhance curriculum and educational theory.

IV. CONCLUSIONS

OBE hints at “mastery”, when in fact most teachers are learners along with their students. Teachers should not set themselves up as experts but as models of inquiry. Much of the argumentation for OBE has not come from teachers or curriculum designers but from those within the field of assessment and testing, and its lore has been widely adopted by central offices and educational policy makers. Outcomes-based education is also objectionable from an ethical deliberative point of view. It begins with outcomes and results and then goes to extremes to plan and deliver instruction that will mould and change students to become what we want them to be. It is a form of human engineering, not a process of education. There is no question that curriculum must have a goal. If a teacher works toward a long-term aim, such as to promote tolerance among students, and then specifies a set of procedures that work towards achieving that goal, states what content is to be used, elucidates the sort of classroom experience necessary, and builds in evaluation of this experimental process, then she will of course be acting rationally and planning rationally. This process casts the teacher in the role of a researcher by examining practice as problematic and curriculum planning, implementation, and research, taking a close look at the work of the students and teachers as the basis for school and curriculum improvement.

OBE suits the technical rationality currently prevailing in the United States and other Western

nations whose policies emphasize high-tech culture and the preparation of students to compete in the workplace for global economic warfare. This skills-oriented model views schools as vocational centres producing workers and rests upon the argument that skill requirements on the job change faster than do curriculum and organizational changes in schools.

This skills model is not an artistic or creative response to the culture of schooling. It is an industrial model that views students as raw materials. As such, it explains the following statement issued by the U.S. Department of Defence Dependents schools: Based upon an assessment of the future we believe our students will face challenges and opportunities in a world characterized by worldwide economic competition and interdependence which creates ever-increasing requirements for job related performance.

The ultimate aim of education is to produce quality learner who will be able to collaborate effectively. Education must teach valuing things for their own sake not because some outcome is associated with it.

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