Civil War’s Impact on Access to Water and Sanitation Services

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Introduction

Civil wars are rooted in longstanding ethnic or religious grievances, as well as in political differences that escalate to armed confrontation. While the armed groups engage in fighting, the consequences impact the population, the economy, and the environment. The fighting translates into deaths of combatants and the civilian population. It also impacts the economy by disrupting the markets, and the exchange of goods and services. As war develops, the environment is affected by the attacks on infrastructure (water canals, dams, roads, pipelines) and by deforestation, pollution, and stress on the natural resources in the areas receiving the displaced population.

By focusing on the environmental consequences of civil war, the paper in the basis of this policy note explores the impacts of civil war on access to water and sanitation services. Civil war may reduce access to water because of the destruction of infrastructure, deforestation, pollution of water bodies, or higher use of water resources, which altogether lead to costs related to water scarcity. Civil war limits access to water, while also impacting the health and productivity of the society that is bearing the burden of violence. Civil war can destroy sewerage systems and prevent families from using proper sanitation facilities. War can also force its victims to adopt unhealthy practices that increase their contact with excreta and pollute water sources.

This paper contributes to the literature on the environmental impact of civil war in four ways. First, it develops variables that measure violence intensity. Taking the Colombian internal armed conflict as a case study, conflict is measured by yearly state-level data of leading conflict indicators (extortions, kidnapping, terrorist attacks, mass-murder victims and attacks against the police, per 100,000 inhabitants).

Second, it uses the household as the level of analysis. Household reactions and behavioral changes may increase or decrease the environmental consequences of any civil war. A household utility maximization model is proposed to explain how the family bears the burden of civil war through modified behavior to various water-access levels.

The third contribution relates to the findings of the theoretical model: civil war could have ambiguous effect. Households can successfully learn to adapt and to cope with conflict offsetting the negative effects.

The fourth contribution is the use of the household-level demographic and health survey (DHS) dataset to explore how access to water changes throughout a civil war. DHS captures location, demographic, and socioeconomic features of a household’s head and mother; it contains a detailed registry of morbidity and mortality of children; it reports features of the inhabited dwelling; and it records
household health-related behaviors and expenses.

**Household coping strategies**

When conflict destroys water sources and infrastructure, or implies their pollution, households may be forced to modify the way they obtain water, and are forced to reduce water usage. Higher costs of collecting water can translate into reduced school enrollment for children, reduced participation of females in the labor force, and higher costs for water-collection equipment (cans, ropes) and water access fees. Access to polluted water is linked with infectious diseases, and blamed for high infant mortality rates worldwide.

**The Colombian context**

The study explores the impacts of civil conflicts on access to water and sanitation services, using a theoretical household model in which civil war enters as a tax – both on the household income and the prices of goods. The model is applied to the demographic health surveys (DHS) and internal armed conflict data for Colombia, South America. While focusing on Colombia, civil wars are global phenomenon with significant consequences on human wellbeing and economic performance in many countries.

In Colombia, the high concentration of land, property, and various institutional failures has led to armed conflict. Three main groups have been engaged in the fighting: the state army, the left-wing terrorist group, and the right-wing terrorist group. Colombian legislation on water and sanitation is primarily based on the national constitution that obliges the national government to invest in water and sanitation as fundamental to the rights of life and health. Additionally, the national government established state-level water plans (*planes departamentales de agua*) as the tools to design and to coordinate with the municipalities the investments aimed at increasing access to drinkable water and improved sanitation services.

Using the Colombian civil war as a case study, and using five waves of the demographic and health survey (DHS) dataset for that country, the effect of civil war is estimated on the access and sanitation services at the household level and on the health-related variables at the individual level. The main results indicate that the effect of civil war is significant and its sign, whether negative or positive, depends on the length of the aggregation or averaging of conflict indicators.

The theoretical results reveal that households care about access to water and sanitation as long as it leads to different levels of consumption and leisure time through changes in children’s health. Decisions are made comparing the gains from healthier children to the households’ net real income. The empirical results suggest that there are both negative and positive effects of civil war on access to water and sanitation services, and on the indicators of children’s health. Results are sensitive to the length of conflict information households consider when making decisions. The positive effect of conflict proves that households adapt by internalizing the violence experience from the past. No evidence is found regarding the counteracting effect of the institutional variables.

**Conclusion**

Possible interventions are necessary during any war, but war itself makes it difficult for any government to solve the trade-off between military expenditure and investment in health, education, access to water, and other social needs. However, to avoid shortages or to reduce the time households spend on getting water, one solution would be for governments to deliver tank trucks that distribute water where needed. In addition, governments should design programs, such as health brigades or the distribution of nutrition supplements, targeting children and their caretakers. The use of several conflict indicators can help find the measures households use as a basis for making their decisions and to account for the environmental effect of war. Further research should address the problem of the institutional variables at the community or extended-family level to control for the support networks households rely upon when living under civil war conditions.

This policy note is based on a paper of the same title.

([http://wspc.ucr.edu/working_papers/WSPC_WP_01_1212_civil%20wars%20impact%20water.pdf](http://wspc.ucr.edu/working_papers/WSPC_WP_01_1212_civil%20wars%20impact%20water.pdf))