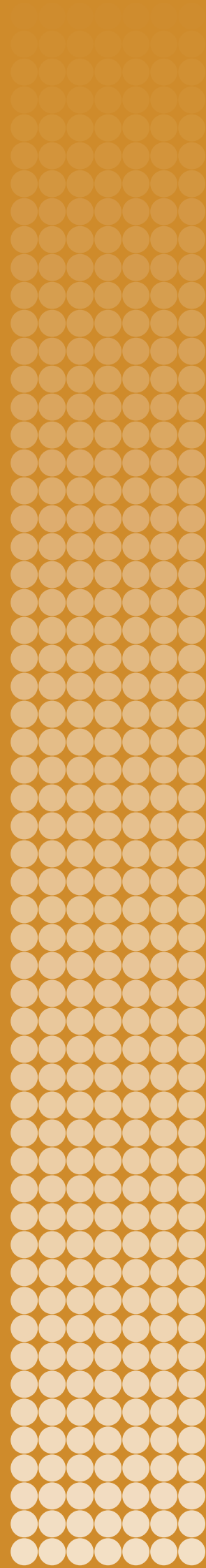


WFP'S CONTRIBUTIONS TO IMPROVING THE PROSPECTS FOR PEACE IN THE CENTRAL AMERICAN DRY CORRIDOR

Spotlight on Climate Change

SANDRA C. VALENCIA



**STOCKHOLM INTERNATIONAL
PEACE RESEARCH INSTITUTE**

SIPRI is an independent international institute dedicated to research into conflict, armaments, arms control and disarmament. Established in 1966, SIPRI provides data, analysis and recommendations, based on open sources, to policymakers, researchers, media and the interested public.

The Governing Board is not responsible for the views expressed in the publications of the Institute.

GOVERNING BOARD

Stefan Löfven, Chair (Sweden)
Dr Mohamed Ibn Chambas (Ghana)
Ambassador Chan Heng Chee (Singapore)
Jean-Marie Guéhenno (France)
Dr Radha Kumar (India)
Dr Patricia Lewis (Ireland/United Kingdom)
Dr Jessica Tuchman Mathews (United States)
Dr Feodor Voitlovsky (Russia)

DIRECTOR

Dan Smith (United Kingdom)



**STOCKHOLM INTERNATIONAL
PEACE RESEARCH INSTITUTE**

Signalistgatan 9
SE-169 70 Solna, Sweden
Telephone: +46 8 655 97 00
Email: sipri@sipri.org
Internet: www.sipri.org

WFP'S CONTRIBUTIONS TO IMPROVING THE PROSPECTS FOR PEACE IN THE CENTRAL AMERICAN DRY CORRIDOR

Spotlight on Climate Change

SANDRA C. VALENCIA



**STOCKHOLM INTERNATIONAL
PEACE RESEARCH INSTITUTE**



World Food Programme

November 2022

© SIPRI 2022

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, without the prior permission in writing of SIPRI or as expressly permitted by law.

Contents

<i>Acknowledgements</i>	iv
<i>The SIPRI–WFP Knowledge Partnership and Disclaimer</i>	v
<i>Executive summary</i>	vii
<i>Abbreviations</i>	xii
1. Introduction	1
2. Dry Corridor context analysis	2
Defining the Dry Corridor	2
Socio-economic indicators for Guatemala and Honduras	3
Conflict analysis	4
Climate change in the Dry Corridor	9
Climate change and conflict in the Dry Corridor	11
Figure 2.1. The Central American Dry Corridor, geographical extension	3
Figure 2.2. Geographic distribution of conflict clusters in Guatemala (left) and Honduras (right)	6
Table 2.1. Estimated average land holding per intended beneficiary household in the Department of La Paz, Honduras	8
3. The Central American Dry Corridor case study	13
Method	13
Limitations of the study	13
WFP Interventions in Guatemala and Honduras	14
Table 3.1. Communities visited or spoken to during fieldwork in Guatemala and Honduras, March to April 2022	14
4. Findings	15
Theory of change 1: Land tenure insecurity in a changing climate	15
Context	15
Analysis	15
WFP’s contributions to peace and conflict sensitivity	16
Recommendations	18
Theory of change 2: Water-related conflicts	19
Context	19
Analysis	21
Conflicts within communities	22
Water-related conflicts between communities	24
Recommendations	27
Concluding remarks	29
Table 4.1. Estimated access to irrigation from communal and individual irrigation systems in the Department of La Paz, Honduras	20
<i>About the author</i>	30

Acknowledgements

The author would like to express her appreciation to all those who provided the possibility to complete this report. The author is grateful to the interlocutors at the World Food Programme (WFP), particularly staff at headquarters and the regional bureau in Panama who participated in virtual interviews before and after field visits. Sincere gratitude goes to Peter Allen (Programme Policy Officer) for facilitating the country visits and for his continued support and engagement during the research process. Special thanks also to Vongai Murugani and Kristina Tschunkert from SIPRI for the support and continuous feedback throughout the research process. Field visits to Guatemala and Honduras took place in March and April 2022. Sincere thanks also go to WFP's country office staff in Guatemala and Honduras and field staff in the departments of Zacapa and Chiquimula in Guatemala and La Paz and Santa Bárbara in Honduras for the great support during fieldwork and with follow-up questions and feedback. The author also extends her deepest gratitude to the intended beneficiaries and local community leaders who shared their experiences and insights with the research team. The author would further like to extend her appreciation to interlocutors in other United Nations organizations, international/local non-governmental organizations, civil society and local partners, non-WFP interviewees, as well as the local government representatives in Guatemala and Honduras. Finally, the author extends her appreciation to the reviewers at SIPRI and WFP, and the SIPRI Editorial Department for their efforts in preparing the report for publication.

The SIPRI–WFP Knowledge Partnership and Disclaimer

WFP and SIPRI established a knowledge partnership in 2018 to help strengthen WFP’s contribution to improving the prospects for peace in the countries where it works. The research for phase I of this partnership visited four case study states—El Salvador, Iraq, Kyrgyzstan and Mali—and produced initial findings in June 2019. The evidence from these case studies indicated that some WFP programming positively contributes to improving the prospects for peace, but also identified various issues that needed to be addressed. The preliminary report made a number of general and country-specific recommendations on how WFP’s contribution to improving the prospects for peace could be improved. However, further research was required to test the robustness and general applicability of the initial findings and recommendations, and to refine and add to them with more case studies. Accordingly, phase II of the inquiry was broadened by adding new states and deepened through a focus on five thematic areas. Eight states were identified for research in phase II: Colombia, Ethiopia, Guatemala, Honduras, Lebanon, Nigeria, South Sudan and Sri Lanka. The five thematic areas are climate change, stabilization, gender, cash-based interventions and measurement. The knowledge partnership has inquired into and reported on these areas in different states; there was also a deep dive in each country into one or two of the thematic areas.

Guatemala and Honduras were part of a regional study on the Dry Corridor. The Dry Corridor research focuses on two thematic areas: climate change and gender. The case study is divided into two reports that reflect the two thematic areas. This report presents the findings from the climate change deep dive. The findings and recommendations are those of the author and do not necessarily represent the positions of SIPRI or WFP, or the management, executive directors or boards of these institutions. The authors alone are responsible for any errors or omissions.

Executive summary

This report analyses how the activities of the World Food Programme (WFP) in the Central American Dry Corridor might contribute to increasing the prospects for peace, or inadvertently for conflict, with a focus on WFP's Food for Assets (FFA) Resilience Programmes in Guatemala and Honduras. This work is part of a Knowledge Partnership between WFP and the Stockholm International Peace Research Institute (SIPRI). The objective of the partnership is to identify: (a) WFP's contribution to improving the prospects for peace; (b) how WFP might enhance its contribution to improving the prospects for peace; and (c) how WFP can measure its contribution to improving the prospects for peace. Twelve case studies explore these questions across five thematic areas: cash-based transfers, climate change, gender, measurement and stabilization.

Research focus and methodology

The research had a dual thematic focus on climate and gender. This report focuses on climate change. The study is qualitative research based on fieldwork in communities where WFP already works in the departments of Chiquimula and Zacapa in Guatemala and in La Paz and Santa Barbara in Honduras. The programmes analysed were WFP's FFA Resilience Programmes with a household focus (in Guatemala) and a community resilience focus (in Honduras). The analysis also includes a pilot project in Honduras, which bridges disaster recovery and resilience building in the wake of hurricanes Eta and Iota in 2020. The fieldwork involved focus group discussions and narrative walks with recipients who are intended to benefit from WFP programming, or 'intended beneficiaries'; and group discussions with WFP partners, local and regional government representatives, and local representatives of international organizations. The research also included document analysis and expert interviews with WFP staff from headquarters, the regional bureau in Panama and both country offices, as well as interviews with a number of non-WFP experts on conflict, peace, agriculture, the environment and climate change.

Countries' contexts: Social and climatic characteristics

Guatemala and Honduras are in a region ranked among the most unequal in the world. Rates of poverty and extreme poverty are particularly high in rural areas. Indigenous people and women are the most affected.

The Central American Dry Corridor is an area that extends through Central America from the west of Guatemala through parts of El Salvador, Honduras and Nicaragua to the north of Costa Rica. It is characterized by marked climatological and ecological aridity, irregular rainfall patterns, high drought risk and low agricultural yields due to gradients and unfavourable chemical and physical soil conditions. It is a mostly rural area and the main livelihood is rain-fed agriculture of basic grains and beans with little access to technologies or irrigation. As a result, diets are limited and households have little surplus for trading. This leaves people highly vulnerable to climate variability and change.

The effects of climate change are already being experienced in the Dry Corridor. The rainy season starts later and has become less regular. Long and severe droughts have affected the Guatemalan and Honduran Dry Corridor for the past decade, resulting in significant crop losses and increasing levels of food insecurity. Climate change projections estimate gradual increases in temperature and reductions in mean monthly

rainfall. Long-term and short-term droughts, such as the midsummer drought (*canícula*), are also projected to lengthen, intensify and become more frequent in the rainy season, when farmers are most dependent on reliable rainfall patterns.

Guatemala and Honduras are also among the world's most violent countries in 'peacetime' with some of the highest murder rates in the world, driven largely by criminal organizations such as gangs (*maras* and *pandillas*) and narco-trafficking organizations. The violence is concentrated in urban areas and along narco-trafficking routes. The isolated rural communities of the Dry Corridor studied here do not experience the same kind or level of violence. People here are more directly affected by common crime, such as theft, mugging and the risk of sexual violence for women.

This report focuses on the concerns and sources of conflict in the Dry Corridor communities. In the context of climate change, these concerns relate to the management of and access to natural resources in a changing climate, particularly land and water. Tensions within and between communities are the most evident sources of conflict, but occasions when tensions over natural resources turn violent are rare. In other parts of both countries, however, conflicts over the management of natural resources have turned violent in the past and community and indigenous leaders have been killed.

Overview of research findings

Theory of change 1: Land tenure insecurity in a changing climate

*If access to stable land tenure agreements for agricultural land, which provide for the right to use the same plot of land for several years and determine how to use it, can be facilitated, **then** tensions between farmers and landowners and among community resilience project intended beneficiaries can be reduced, **because** farmers will be able to carry out soil conservation activities on the same plot of land and reap the benefits of improved crop yields, increasing their food security and their ability to pay for their rented land.*

Land tenure insecurity is a common issue for small-scale farmers in Guatemala and Honduras. Ownership of land, the highest form of land tenure security, is rare for WFP FFA intended beneficiaries in both countries. For small-scale farmers, the amount of land cultivated (owned or rented) often fails to produce a high enough yield to meet a family's basic food needs for a year. The impacts of climate change are likely to increase competition for land and water, and those without land ownership will be worst affected. Land tenure insecurity could become a source of conflict in a changing climate because in years of bad yields farmers may be unable to pay their rent, creating a point of contention between landowners and renters. In a few of the communities researched, farmers have lost access to plots after being unable to pay rent in a bad yield year.

Furthermore, those who rent land are not always free to decide how to use it as landowners often restrict their activities. WFP engages directly and indirectly with land tenure issues through its FFA Resilience Programmes in the Dry Corridor. WFP has devised a number of alternatives to try to circumvent land tenure challenges through its FFA Resilience Programmes in the Dry Corridor. For example, WFP has supported communities in Guatemala and Honduras to work together on a shared plot of land that the group borrows, rents or buys. Because negotiating and purchasing power increases as a group, this has allowed some groups to buy land jointly that they could not have afforded as single households. Other groups have negotiated to be able to carry out soil conservation activities on the borrowed or rented land, which

is sometimes owned by one of the group members. WFP is contributing to peace by building social cohesion through such group activities and by providing technical support to groups with the creation of rural credit unions.

Theory of change 2: Water-related conflicts

*If the management of key water resources takes an integrated watershed management approach and takes the different users (intended beneficiaries and non-beneficiaries inside and outside the community) into consideration, and this multi-actor integrated approach is incorporated into the design and implementation phases of WFP FFA resilience programmes, **then** the risk of water-related conflicts within and between communities over access to and the management of the water resource can be reduced.*

Water sources are often a source of conflict in the communities visited, where the owner of the land where the water spring is located also controls the water resource and can allow or block access to it by nearby users. These conflicts have not turned violent but have on several occasions required the intervention of municipal and national authorities as well as legal counsel.

In many of the communities visited, drinking water is not available on a continuous basis but only in rotating schedules. Irrigation is also very limited and where it does exist, often reliant on rotating irrigation schedules within communities. These schedules require high levels of community organization.

Climate change is expected to reduce water availability, putting increased stress on households and generating increased social tensions. WFP has helped to resolve some water-related conflicts by supporting communities with legal counsel, supporting relevant national institutions to intervene in a contested watershed and assisting the development of watershed management plans.

As part of its FFA Resilience Programmes, WFP has supported the provision of water-related infrastructure in its intended beneficiary communities. In some projects, the infrastructure uses water from a contested resource, which could inadvertently support one side of a water conflict and contribute to the escalation of that conflict.

Summary of recommendations

During project preparation

1. WFP should continue to support both agriculture- and non-agriculture-based livelihood diversification.
2. WFP should carry out gender-sensitive watershed level and conflict analyses to identify the main users and potential users of the water resources available to beneficiary communities.
3. WFP should facilitate dialogues among stakeholders on the impacts and benefits of potential WFP water-related interventions.
4. WFP should continue to accompany irrigation interventions with support for fair and gender-sensitive water governance.
5. Wherever possible, WFP should try to engage with the larger landowners who rent land to intended beneficiaries. These engagements should aim to raise awareness of the benefits of soil conservation activities while also facilitating land rental agreements with clear and stable conditions.

6. In the case of group agricultural activities, WFP should facilitate and support the development of clear land borrowing or rental agreements with the landowner, in written form, and develop a group transition strategy for when the borrowing arrangements end.

During project implementation

7. To reduce the potential for tensions to arise from group agricultural activities on jointly worked land, WFP should facilitate arrangements to ensure that the amount of work and time required is reasonable, and that all intended beneficiaries understand the potential benefits.
8. In addition, WFP should include the development of gender inclusive conflict prevention and management mechanisms as well as shared decision-making mechanisms to reduce the risk that group tensions escalate.
9. WFP, in partnership with national and local government entities, should continue to support the development of irrigation systems on land that is purchased or rented by groups.
10. WFP should support community development of much-needed improved mechanisms for governing water resources and their use that take explicit account of potentially conflicting uses and the impacts of climate variability and change, and are gender sensitive.
11. WFP should facilitate negotiations on water rights and the establishment of micro-watershed management plans and watershed use rights agreements between the various users with the support of local and national institutions.
12. WFP should make capacity building of negotiation skills, and gender-sensitive conflict prevention and management mechanisms for intended beneficiaries part of FFA Resilience Programmes.
13. WFP should continue to provide technical and financial support to watershed restoration and protection activities, such as reforestation, the establishment of agricultural buffer zones, and the definition of minimum ecological flow and watershed management plans, to name just a few.

Exit strategy and sustainability (plan beyond WFP's interventions)

14. WFP should support communities to plan beyond WFP interventions.

This report shows that the WFP FFA programmes that seek to increase resilience in the Dry Corridor regions of Guatemala and Honduras can contribute to peace. The findings presented in this report show that, in addition to the aspects that improve the prospects for peace, these programmes raise some conflict sensitivity concerns related to access to key natural resources, household and group dynamics, and tensions between intended beneficiaries and non-beneficiaries. If conflict sensitivity risks are not identified and addressed, they can inadvertently increase the risk of conflict. These concerns are familiar from other WFP working contexts and are one of the reasons why WFP and SIPRI engaged in their knowledge partnership.

Although WFP's priority mandate is and will continue to be to eliminate hunger through its interventions to save and change lives, some of its programmes are already

contributing to maintaining peace. To address conflict sensitivity concerns, WFP could increase its efforts on conflict analysis and conflict sensitivity risk assessment, while also exploring the recommendations summarized above and set out in greater detail below. If implemented, these would help to make WFP's contribution to improving the prospects for peace in the Dry Corridor more systematic and consistent.

Abbreviations

CGIAR	Consultative Group on International Agricultural Research
FFA	WFP's Food for Assets
FGDs	Focus Group Discussions
TOC	Theory of change
WFP	World Food Programme

1. Introduction

This case study report presents an analysis of the contributions of the World Food Programme (WFP) to maintaining peace in the Central American Dry Corridor, with a focus on Guatemala and Honduras. This work is part of the WFP and Stockholm International Peace Research Institute (SIPRI) Knowledge Partnership. The objective of the partnership is to identify: (a) WFP's contribution to improving the prospects for peace; (b) how WFP might enhance its contribution to improving the prospects for peace; and (c) how WFP can measure that contribution. These questions are explored in 12 case studies across five thematic areas: cash-based transfers, climate change, gender, measurement and stabilization.

For the SIPRI Dry Corridor analyses, Guatemala and Honduras were selected to provide a regional perspective on how WFP's activities in the Dry Corridor can contribute to peace or inadvertently contribute to conflict. The research in the Dry Corridor adopted a dual thematic focus on climate and gender.¹ This report focuses on climate change. The communities researched are located in the Chiquimula and Zacapa departments in Guatemala, and in the La Paz and Santa Barbara departments of Honduras.

The Consultative Group on International Agricultural Research (CGIAR) was also part of the partnership with WFP in 2 of the 12 case studies. In the Dry Corridor, CGIAR carried out a quantitative analysis of the linkages between climate change and conflict at the national and municipal levels in Honduras, Guatemala and El Salvador.² This report is based on a qualitative analysis using rural communities in Guatemala and Honduras as units of analysis. It takes a qualitative approach and the analysis is at the rural community level in Guatemala and Honduras. The CGIAR report and this report take two contrasting approaches to analysing the relation between climate, food security and conflict.

Chapter 2 provides a context analysis of the Central American Dry Corridor and introduces the context of the region with respect to conflict and climate. Chapter 3 explains the research approach and objectives. Chapter 4 presents the key findings of the climate change deep dive.

¹ Murugani, V., *WFP's Contributions to Improving the Prospects for Peace in the Central American Dry Corridor: Spotlight on Gender* (SIPRI: Stockholm, forthcoming).

² Pacillo, G. et al., 'Assessing the relationship between climate, food security and conflict in Ethiopia and in the Central American Dry Corridor (CADC): Quantitative analysis on the impact of climate variability on conflict in Ethiopia and in the CADC countries', CGIAR Focus on Climate Security, Nov. 2021.

2. Dry Corridor context analysis

Defining the Dry Corridor

The Central American Dry Corridor is not precisely defined and its geographical delimitation varies from study to study. It is generally defined as an area that extends through the Central American isthmus along the Pacific littoral from the west of Guatemala through parts of El Salvador, Honduras and Nicaragua to the north of Costa Rica (see figure 2.1).³ It comprises areas with marked climatological and ecological aridity, irregular rainfall patterns, dry seasons that last at least four months, high drought risk due to physical conditions, dry tropical forest ecosystems, where forest cover still exists, and low agricultural yields due to slopes and unfavourable chemical and physical soil conditions. It is a mostly rural area and covers lower areas of the Pacific basin and a large proportion of the central pre-mountainous areas (0–800 metres above sea level).⁴

While numbers vary by country, about two-thirds of the rural population of the Dry Corridor live in poverty and three-quarters of those live in extreme poverty with significant levels of malnutrition. The main livelihood activity is agriculture, with a prevalence of family farms producing staples such as corn, beans and rice. However, the majority of the farming is based around rain-fed agriculture and lacks the access to technology, irrigation or road infrastructure required to diversify production and sell on international markets.⁵ As a result, diets are limited, and households have little surplus to sell and often not even sufficient production to cover the household's food needs for the entire year. The average monthly income from farming and other livelihoods has been estimated at approximately US\$177.⁶ This leaves little room to cover eventualities linked to droughts, pests, extreme weather events or socio-economic shocks, such as the Covid 19 pandemic.⁷

The Guatemalan and Honduran Dry Corridor

The Guatemalan Dry Corridor comprises a number of municipalities in 11 departments, with a population of about 3 million people, and covers 9 per cent of the land area of the country.⁸ The term first attracted attention in Guatemala and abroad in 2009 when the El Niño Southern Oscillation (ENSO) resulted in a prolonged mid-summer drought (*canícula*) that affected 60 to 80 per cent of the harvest.⁹

³ Some delimitations of the Dry Corridor also include Panama's Dry Arc (*Arco Seco*), which is geographically disconnected from the most southern part of the main Dry Corridor by about 600 km. See Gotlieb, Y. et al., 'The Central American dry corridor: A consensus statement and its background', *Revista Yu'am*, vol. 3, no. 5 (2019), p. 42.

⁴ Calvo-Solano, L., 'Los impactos de la sequía en el sector primario en el Corredor Seco Centroamericano' [The impacts of drought in the primary sector in the Central American Dry Corridor], *Agronomy Mesoamerican*, vol. 29, no. 3 (Sep.–Dec. 2018), p. 696; and Gotlieb et al. (note 3), pp. 42–44.

⁵ Calvo-Solano (note 4), p. 696.

⁶ The Guatemalan basic monthly food basket was estimated to cost Q. 3134.40 (about US\$403) in Feb. 2022. Instituto Nacional de Estadística (INE), *Canasta Básica Alimentaria (CBA) y Ampliada (CA), Feb. 2022*, INE, Guatemala, 2022. In Honduras, the weekly basic food basket for rural areas was estimated to cost L1436.3 (about US\$58) in June 2021, and for urban areas L1914.6 (about US\$78) Instituto Nacional de Estadística (INE), *LXXII Encuesta Permanente de Hogares de Propósitos Múltiples*, INE, Honduras, 2021.

⁷ Gotlieb, Y. and García Girón, J. D., 'The role of land use conversion in shaping the land cover of the Central American Dry Corridor', *Land Use Policy*, vol. 94 (2020), p. 4.

⁸ The 11 departments are El Progreso, Jalapa, Jutiapa, Zacapa, Chiquimula, Huehuetenango, Quiché, Totonicapán, Chimaltenango, Baja Verapaz and Guatemala.

⁹ The El Niño Southern Oscillation (ENSO) is a recurrent climate pattern and refers to the interaction between the atmosphere and the ocean in the tropical Pacific that results in a periodic variation between below-normal and above-normal sea surface temperatures and dry and wet conditions over the course of a few years. During El Niño, west to east winds drive warm equatorial waters from the western Pacific towards the eastern Pacific and northern South America. In Central America, El Niño results in a reduction in rainfall. See El Niño, Colombia University [n.d.]; and United Nations Framework Convention on Climate Change, *Tercera comunicación nacional sobre cambio climático de Guatemala* [Third national communication on climate change in Guatemala], 12 Mar. 2021, p. 153.

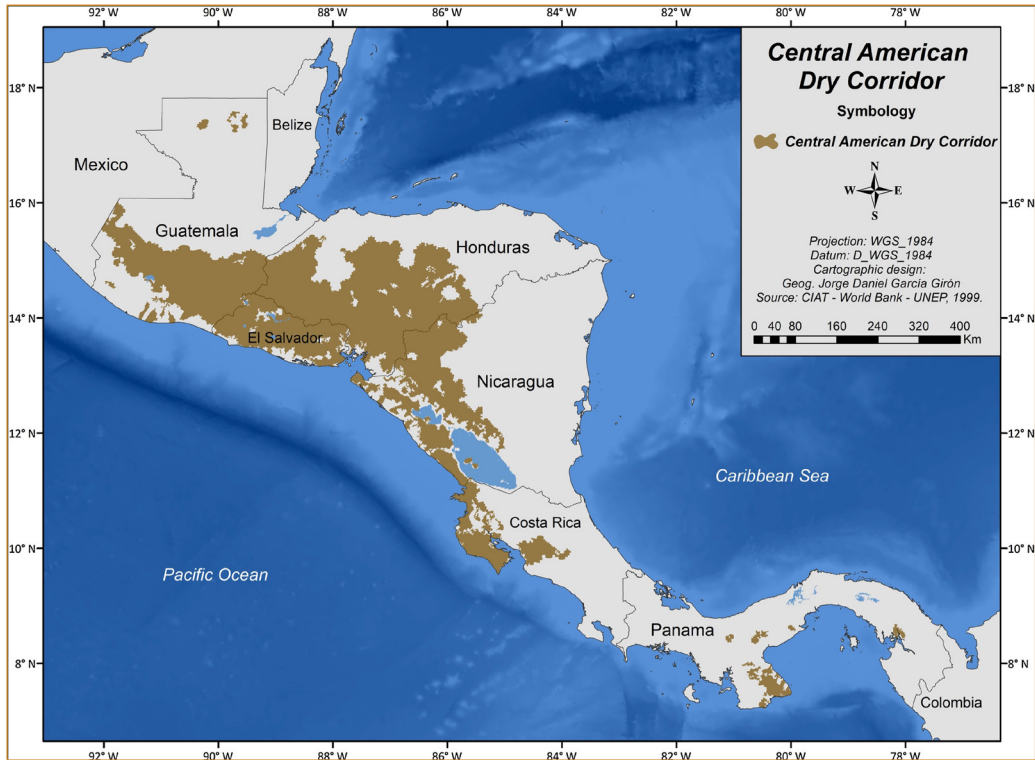


Figure 2.1. The Central American Dry Corridor, geographical extension

Source: Gotlieb, Y. and García Girón, J. D., ‘The role of land use conversion in shaping the land cover of the Central American Dry Corridor’, *Land Use Policy*, vol. 94 (2020), p. 4.

The Honduran Dry Corridor comprises territories in 12 departments in the western, central and southern parts of Honduras, host to 23.4 per cent of the population.¹⁰ A number of extreme weather events have affected the region in recent years, such as long and severe droughts in 2014, 2015, 2018 and 2019, involving significant crop losses of up to 80 per cent. Almost 70 per cent of the population in the Honduran Dry Corridor is estimated to be in a state of moderate to severe food insecurity.¹¹

Socio-economic indicators for Guatemala and Honduras

Central America has exhibited considerable improvements in human development in recent decades, but the level of inequality is still ranked among the highest in the world. This is manifest in the social and economic marginalization of a large part of the population.¹²

In Guatemala, rates of poverty and extreme poverty increased between 2000 and 2014, from 56.2 to 59.3 per cent and from 15.7 to 23.4 per cent, respectively.¹³ Indigen-

¹⁰ The 12 departments are El Paraíso, Choluteca, Francisco Morazán, Valle, La Paz, Intibucá, Lempira, Ocotepeque, Copán, Comayagua, Yoro and Olancho. UNICEF, *Ahora lo urgente: Impacto de la sequía en las niñas, niños y adolescentes del corredor seco de Honduras* [Now What is Urgent: The Impact of Drought on Children and Adolescents in the Dry Corridor of Honduras] (UNICEF Honduras: Tegucigalpa, 2016), p. 9; and Fraga, F., *Central American Dry Corridor: An Exploration of the Potential of a Job Creation Strategy for Guatemala and Honduras*, Working Paper no. 23 (International Labour Organization: Geneva, 2020), p. 32. Fraga mentions 14 departments as part of the Dry Corridor but without naming them.

¹¹ Republic of Honduras, National Climate Change Directorate, ‘Mi Ambiente+: Tercera Comunicación Nacional sobre Cambio Climático ante la Convención Marco de Las Naciones Unidas sobre Cambio Climático’ [My environment+: Third National Communication on climate change to the United Nations Framework Convention on Climate Change], Dec. 2019, p. 23.

¹² The World Bank defines the poverty line as living on less than \$3.20 a day and the extreme poverty line as living on less than \$1.90 a day. See World Bank, *Poverty and Shared Prosperity 2020: Reversals of Fortune* (World Bank: Washington, DC, 2020), p. 39.

¹³ The most recent available poverty and extreme poverty rates from Guatemala’s National Institute of Statistics are from 2014, see Instituto Nacional de Estadística, ‘Encuesta Nacional de Ingresos y Gastos de los Hogares

ous populations are worst affected, as 69.3 per cent of indigenous households live in poverty.¹⁴ Rural areas display the most acute indicators of multidimensional poverty (87.5 per cent), which encompasses lack of education or employment, inadequate housing, poor health and nutrition, and high levels of personal insecurity and social isolation.¹⁵ Guatemala also has one of the most unequal distributions of resources and capital in the world, which concentrates wealth in the hands of a small elite.¹⁶ Women, and in particular indigenous and rural women, are most affected by these inequalities due to the entrenched racial exclusion and patriarchal systems in the country.¹⁷

Honduras has the second-highest rate of extreme poverty in Latin America and the Caribbean. The situation is worse in rural and indigenous areas, where 6 out of 10 households live in extreme poverty, resulting in chronic malnutrition for a quarter of the population.¹⁸ Poverty affects 48.3 per cent of the population.¹⁹ This has adverse effects on the livelihoods and food security of the most vulnerable groups, for instance leading to high school-dropout rates due to families being unable to cover the minimum expenses required to send children to school. Among the most vulnerable are girls, pregnant and lactating women, and children under the age of five living in rural and indigenous areas, as well as people with disabilities and those living with HIV.²⁰

Conflict analysis²¹

Guatemala and Honduras are among the world's most violent countries in 'peacetime' with some of the highest murder rates in the world.²² Criminal organizations, such as gangs (*maras* and *pandillas*) and narco-trafficking organizations, are the main perpetrators of violence in Central America. The heightened levels of violence in Guatemala and Honduras manifest themselves in multiple forms linked to various political, social, economic and historical causes.²³ The government's inability to enforce the law and protect its citizens is a significant factor that drives insecurity in both states.²⁴ High levels of impunity and corruption paralyse the ability of the state—notably the police, judges, prosecutors and prisons—to maintain law and order. Impunity and

-ENIGH- 2021–2022', [n.d.].

¹⁴ Indigenous households are defined as households where the head of the household self-identifies as indigenous. See Institucional Nacional de Estadística (INE), Guatemala, *Compendio Estadístico de Pueblos 2015* [Statistical compendium of population groups 2015], INE, 2016, p. 5.

¹⁵ Daroca Oller, S., 'Exploring the pathways from climate-related risks to conflict and the humanitarian-development-peace nexus as an integrated response: Guatemala case study', *United Nations Development Programme Issue Brief*, no. 21/2020.

¹⁶ Brands, H. 'Crime, irregular warfare, and institutional failure in Latin America: Guatemala as a case study', *Studies in Conflict & Terrorism*, vol. 34, no. 3 (2011).

¹⁷ Daroca Oller (note 15).

¹⁸ World Food Programme, 'Honduras annual country reports: Honduras', 31 Mar. 2019.

¹⁹ World Bank, Poverty & Equity Brief, Latin America & the Caribbean, 'Honduras', Apr. 2021.

²⁰ World Food Programme (WFP) (note 18); and WFP, 'Honduras Country Strategic Plan, 2018–2021', WFP/EB.1/2018/6-A/4, 7 Feb. 2018.

²¹ This section benefited from secondary data collected and analysed, and text written by Caroline Delgado at SIPRI.

²² Herrera, M., 'Homicides in Central America: Toward a better understanding of territorial trends, causes, and dynamics', Wilson Center, 24 June 2019; and Richani, N., 'State capacity in postconflict settings: Explaining criminal violence in El Salvador and Guatemala', *Civil Wars*, vol. 12, no. 4 (2010).

²³ Rodgers, D., *Slum Wars of the 21st Century: The New Geography of Conflict in Central America* (Crisis States Research Centre, London School of Economics: London, 2006); Kay, C., 'Reflections on rural violence in Latin America', *Third World Quarterly*, vol. 22, no. 5 (2001); Richani, N., 'State capacity in postconflict settings: Explaining criminal violence in El Salvador and Guatemala', *Civil Wars*, vol. 12, no. 4 (2010); International Crisis Group, *Mafia of the Poor: Gang Violence and Extortion in Central America* (International Crisis Group: Brussels, 2017); and King, M. W. et al., 'Environmental governance and peacebuilding in post-conflict Central America: Lessons from the Central American Commission for Environment and Development', eds Bruch, C., Muffett, C. and Nichols, S. S., *Governance, Natural Resources and Post-Conflict Peacebuilding* (Earthscan from Routledge: London, 2016).

²⁴ Merken, S., 'Torn social fabric: Water, violence and migration in Central America', NewSecurityBeat, Wilson Center, 8 Feb. 2017.

corruption also undermine citizens' trust in the state and divert scarce resources to law enforcement.²⁵ The failure to construct effective state institutions has enabled some criminal organizations to penetrate all levels of government and broaden their reach in both countries.²⁶

Socio-economic inequality was one of the main drivers of the civil war in Guatemala, which ended in 1996. High levels of land concentration, and unequal access to land in particular were at the root of the armed conflict. The civil war resulted in thousands of deaths and people being forcibly displaced or disappeared.²⁷ The peace accords were intended to address these issues and provide an ambitious framework for the transformation of an authoritarian, exclusionary state into a modern liberal democracy. Few of the promised socio-economic reforms were carried out, however, due to weak institutional capacity and vested economic and political interests among the elites and military that dominate the state.²⁸ Rapid urbanization, flawed democratic development, the transnational drug market and state-led repression in the post-war period are among the leading causes of the current extreme levels of violence.²⁹

Honduras has not experienced a civil war. However, a military coup against the democratically elected president in 1963 ushered in an era of military regimes that lasted for almost 20 years. The country adopted a new constitution in 1982, but the democratic transition that followed suffered from grave flaws and the security forces and armed forces continued to exert considerable influence over policymaking. The democratic transition was eventually halted by a military coup in 2009. The military coup and subsequent two years of political turmoil diverted the attention and resources of the state security forces away from combating organized crime.³⁰ According to the UN Office on Drugs and Crime, territorially based crime groups have grown in prominence in Honduras since the coup, and there is evidence of increased gang involvement in narcotics trafficking.³¹ Following the coup, Honduras witnessed a concentration of power in the hands of the ruling National Party, and checks and balances on state power have been reduced by its growing influence over the judiciary and electoral institutions. The erosion of checks and balances on executive power over the past decade has created fertile ground for corruption. Politicians reportedly work with organized crime at every level of government. Criminal gangs are so territorially widespread that local politicking requires interaction between would-be elected officials and gang members.³²

National violence and murder statistics disguise sub-national variations. For example, violence in Guatemala is primarily concentrated around the capital and in the north-eastern Petén region, while many other areas have seen low levels of violence since the end of the civil war.³³ Similarly, in Honduras, violence is concentrated in larger urban centres (see figure 2.2). In both countries, border and coastal areas often

²⁵ International Organization for Migration (IOM) et al., *Hunger Without Borders: The Hidden Links Between Food Insecurity, Violence and Migration in the Northern Triangle of Central America*.

²⁶ Shifter, M., *Countering Criminal Violence in Central America*, Council on Foreign Relations, Center for Preventive Action, Council Special Report no. 64 (Apr. 2012).

²⁷ Navas, G., Mingorria, S. and Aguilar-González, B., 'Violence in environmental conflicts: The need for a multi-dimensional approach', *Sustainability Science*, vol. 13, no. 3 (2018), pp. 649–60.

²⁸ Gavigan, P., 'Organized crime, illicit power structures and Guatemala's threatened peace process', *International Peacekeeping*, vol 16, no. 1 (2009).

²⁹ International Crisis Group, *Mafia of the Poor: Gang Violence and Extortion in Central America*, Latin America report no. 63 (International Crisis Group: Brussels, 2017).

³⁰ Shifter (note 26).

³¹ UN Office on Drugs and Crime (UNODC), *Transnational Organised Crime in Central America and the Caribbean: A Threat Assessment* (UNODC: Vienna, Sep. 2012).

³² International Crisis Group, *Fight and Flight: Tackling the Roots of Honduras' Emergency*, Latin America report no. 77 (International Crisis Group: Brussels, 2019).

³³ Seay-Fleming, C., 'Beyond violence: Drought and migration in Central America's northern triangle', *New Security Beat*, Wilson Center, 12 Apr. 2018; and Herrera (note 22).

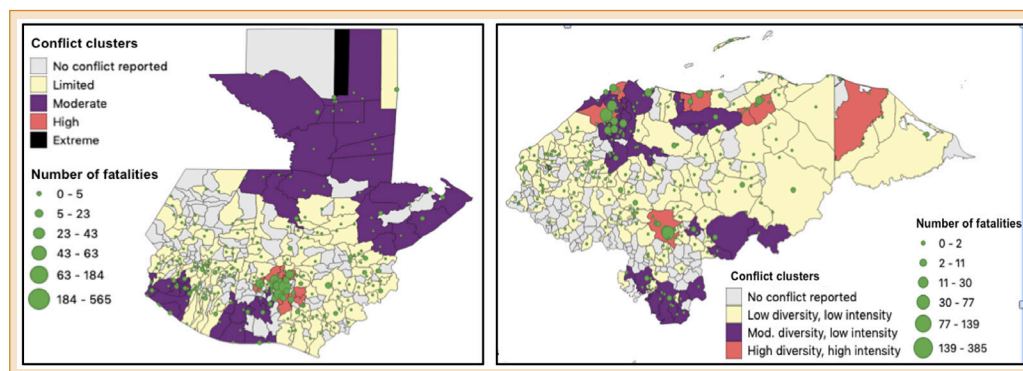


Figure 2.2. Geographic distribution of conflict clusters in Guatemala (left) and Honduras (right)

Note: Conflict intensity is measured by the total number of conflict events and fatalities. Conflict events include battles, violence against civilians, protests and riots.

Source: Pacillo, G. et al., *Assessing the Relationship between Climate, Food Security and Conflict in Ethiopia and in the Central American Dry Corridor (CADC): Quantitative Analysis on the Impact of Climate Variability on Conflict in Ethiopia and in the CADC Countries* (CGIAR: Nov. 2021). pp. 39–40.

have higher murder rates due to their links to drug-trafficking corridors.³⁴ Explanations for the low incidence of gang or organized crime-related violence in rural areas reference their sparse populations and isolated, remote locations, as well as their strong mechanisms for social integration.³⁵

In both countries, even in areas with low murder rates, there are high rates of sexual violence and manifestations of violence against women, youth and children. Conflict over the use of and access to natural resources, such as farmland, forests, water and minerals, also occurs in rural areas in both countries.³⁶ Central America is considered one of the most dangerous and violent regions in the world for environmental campaigners. Narco-trafficking has been linked to extractive industries, environmental damage and conflict over the use of natural resources, as traffickers launder illegal income in the legal economy through investment, for example, in land for cattle grazing or timber production.³⁷ In both countries, disputes over access to land—typically between powerful landed interests and a dispossessed peasantry—have often led to violence; the overall scarcity of arable land has also been a source of conflict.³⁸

Violence in the Dry Corridor

The Dry Corridor communities visited in Guatemala and Honduras are directly and indirectly affected by the same weak state presence and high levels of violence as other parts of the country, as well as unequal gender norms, corruption and organized crime. However, there was no evidence in most of the communities of high levels of violence linked to organized crime.³⁹ Overall, research participants did not identify violence or murder as problems in their communities.⁴⁰ Instead, residents were more directly affected by common crimes such as theft and mugging, and the risk of sexual violence for women, albeit on a much smaller scale than in urban areas. Exposure to common crimes was highest for both men and women when leaving their

³⁴ Méndez, M. J., 'The violence work of transnational gangs in Central America', *Third World Quarterly*, vol. 40, no. 2 (2019).

³⁵ Herrera (note 22), p. 9

³⁶ Navas, Mingorria and Aguilar-González (note 27).

³⁷ Navas, Mingorria and Aguilar-González (note 27).

³⁸ King et al. (note 23).

³⁹ Key Informant Interviews, WFP field staff in Guatemala and Honduras, and focus group discussions, Guatemala and Honduras, Mar./Apr. 2022.

⁴⁰ This is corroborated by WFP's field monitoring staff who visit and tour the communities regularly.

communities for work, to study or to collect water or firewood.⁴¹ Organized crime still influences lives indirectly, however, as it permeates society and influences politics and rural public investment through corruption and clientelist practices.⁴² In other words, the everyday concerns of the Dry Corridor rural communities visited were not about gang- or drug-related violence.⁴³

The theories of change (TOCs) presented in this report reflect the above and focus on the concerns and sources of conflict in the communities visited. In the context of climate change, these concerns relate to the management of and access to natural resources, particularly land and water, in a changing climate. Tensions within and between communities are the most evident sources of conflict. These negatively affect social cohesion and trust among residents, and also between the population and the state. In the communities visited, the occasions when tensions over natural resources have turned violent are scarce or non-existent. In other parts of both countries, however, conflicts over the management of natural resources have turned violent in the past, and community and indigenous leaders have been killed.⁴⁴ Most of those cases have been related to large projects, such as hydroelectric projects or extractive projects, including mining and logging, where the actors involved, in addition to local communities, were national and international corporations, the military and the state. These types of conflict have not occurred in the communities visited, but some have occurred in areas in the same department; for example, in Chiquimula in Guatemala and La Paz in Honduras.⁴⁵

Land tenure insecurity as a historic process of marginalization

Land tenure insecurity is a common issue for small-scale farmers in Guatemala and Honduras.⁴⁶ Historically, as far back as the colonial period, land ownership has been concentrated in a small number of hands, and small-scale farmers have enjoyed little or no land ownership.⁴⁷ In Guatemala, 2 per cent of the population owns 72 per cent of the arable land and only 8 per cent of women have access to land.⁴⁸ Correspondingly, ownership of land, which is the highest form of land tenure security, is rare for WFP Food for Assets (FFA) participants in both countries: just 30 per cent of those intended to benefit from WFP programmes (intended beneficiaries) own land in Guatemala and 54 per cent in Honduras.⁴⁹

Concentration of land ownership, and the exclusion and marginalization of rural communities have been sources of conflict—both violent and non-violent—in Central America throughout its history. Contract killings related to land disputes have been

⁴¹ Focus group discussions in Guatemala and Honduras, Mar./Apr. 2022.

⁴² Key informant interview and focus group discussions, Guatemala and Honduras, Mar./Apr. 2022.

⁴³ One exception may be one of the communities in the Santa Barbara department in Honduras, which is located near a drug trafficking and outmigration corridor bordering Guatemala, where research participants expressed, in part through silence and looks, their fear of speaking up about drug trafficking and its impact on the community. Honduras Focus group discussion, Apr. 2022.

⁴⁴ Navas, Mingorria and Aguilar-González (note 27).

⁴⁵ See e.g. Community Press, 'Asesinan a luchador social que dedicó su vida a defender la vida' [They murder a social fighter who dedicated his life to defending life], 8 Mar. 2013; and Environmental Justice Atlas, 'Honduras'.

⁴⁶ Land tenure refers to the complex relationship that individuals and groups have with respect to land and land-based resources, such as water, forest and pasture. Land tenure arrangements in a society regulate how land is owned, used, controlled and transferred, and determine the rights of individuals and groups with respect to that land. Land tenure arrangements can be formal, as defined in law, or informal and implemented through customary systems. See USAID, 'What is land tenure', [n.d.]; and Ashley, J. M., 'Cross-cutting issues', ed. J. M. Ashley, *Food Security in the Developing World* (Academic Press: Cambridge, MA, 2016).

⁴⁷ Rivera Ocampo, R. M. et al., *Acceso, Tenencia y Gobernanza de la Tierra en la Región Trifinio (Guatemala-Hondura-El Salvador)* [Access, tenure and governance of the land in the Trifinio Region (Guatemala-Hondura-El Salvador)] (Fundación Nacional Para El Desarrollo, FUNDE: San Salvador, 2017).

⁴⁸ Daroca Oller (note 15), p. 4.

⁴⁹ World Food Programme (WFP), *The Land Question in Central America: WFP's Lessons Learned from Implementing Resilience Building Projects* (WFP: Rome, forthcoming).

Table 2.1. Estimated average land holding per intended beneficiary household in the Department of La Paz, HondurasIn tareas (437 m²) (and in ha in parenthesis)

Community	Household land area ^a
Cerro Verde	8 (0.35 ha)
El Borbollón	4 (0.17 ha)
Tres Cruces	5 (2.22 ha)
Las Mercedes	7 (0.30 ha)

^a Household land area refers to average land owned per household and used for agriculture (only intended beneficiary households included).

Source: Data collected verbally from intended beneficiaries by WFP La Paz field office staff, May 2022.

documented in Honduras.⁵⁰ There were more than 1500 agrarian conflicts in Guatemala between 2015 and 2018.⁵¹ These conflicts are often rooted in issues related to land distribution, natural resource management and the failure of public policies to recognize and enforce communal land and collective property arrangements. Contract killings and the forced and violent eviction of farmers and indigenous people are evidence that violence has been a common approach to addressing land-related conflicts in both countries.⁵²

Farmers' demands in the 20th century and subsequent land reforms and land redistribution initiatives distributed a limited amount of land to low-income farmers, but the amounts were small and much of the land was degraded.⁵³ Even in those families that own land, subdivisions through inheritance have significantly reduced the amount of agricultural land available to them.⁵⁴

Land tenure and food insecurity

The types of land tenure varied in the communities visited in Guatemala and Honduras, but many of the intended beneficiary families did not own but had to rent land for agriculture. The three types of land tenure in the Honduran Dry Corridor are: (a) those without land tenure, 30–35 per cent of the population; (b) those with small plots of land but no title, half the population;⁵⁵ and (c) large landowners (*terratenientes*) who own large areas of land and cultivate it commercially (10 per cent of the population). The large landowners control most of the land and the sources of water.⁵⁶ In Guatemala, the ProRes baseline document states that 48 per cent of households reported that they owned the land they work on, 23 per cent rent their land and 18 per cent 'borrow' it.⁵⁷ As in Honduras, those who own their land may have a private purchase agreement but no official land title, which is required to obtain credit from financial institutions.⁵⁸ Women, and particularly indigenous women, face additional barriers in both countries due to their heavily patriarchal systems, which makes access to land even more difficult.⁵⁹

⁵⁰ Moser, C. and Winton, A., 'Central American region: Towards an integrated framework for violence reduction', *Overseas Development Institute (ODI) Working Paper* no. 171 (2002), p. 13.

⁵¹ Daroca Oller (note 15), p. 4.

⁵² Daroca Oller (note 15), p. 4; and Centro de Estudio para la Democracia (CESPAD), *Estudio de caso: Tenencia de la tierra y seguridad alimentaria en CNTC* [Central Nacional de Trabajadores del Campo]-La Paz [Case study: Land tenure and food security in the CNTC [National Union of Farmworkers], La Paz (CESPAD, 2018).

⁵³ Rivera Ocampo (note 47).

⁵⁴ Focus group discussions and narrative walks in Guatemala and Honduras, Mar/Apr. 2022.

⁵⁵ This population has established itself on the land and may have a purchase agreement (*compraventa*) or inheritance document but not an officially registered title to the land.

⁵⁶ Key informant interview, WFP Honduras Country Office staff, Mar., 2022.

⁵⁷ European Union and World Food Programme, 'Línea de Base: Programa PRO-Resiliencia [Baseline pro-resilience programme]', WFP Guatemala, 2021, p. 13.

⁵⁸ Cumbersome and costly registration procedures are a deterrent to official land titling. Large landowners have taken advantage of this and use their purchasing and political power to grab land, register it under their name and dispossess small-scale farmers. Centro de Estudio para la Democracia (note 52).

⁵⁹ Key informant interview, Mar. 2022.

In both countries, families that do not own land rent land for cultivation from large landowners within the community or nearby. Those families that own a small plot of land often have between one and two *manzanas*, which is equivalent to 0.70–1.4 hectares.⁶⁰ These plots are often not sufficient to cultivate the amount of food required to provide for a family for the whole year. Thus, even families that own land often rent another plot nearby. Table 2.1 provides data on land ownership in the communities visited in the department of La Paz.

Climate change in the Dry Corridor⁶¹

Current climatic conditions

The Dry Corridor is characterized by drier conditions than other parts of Central America and the area is prone to droughts. It has a long dry season from November to April, a wet season normally between May and October with frequent dry spells, and a distinct mid-summer drought or *canícula* when temperatures rise and rainfall decreases sharply. Annual rainfall has a characteristic bimodal distribution with one peak in June and one in September. The lowest and highest temperatures are normally recorded in December to January and March to April, respectively.⁶²

Climate change projections

The effects of climate change are already being experienced in Central America. There is a delayed start to the rainy season, which is also less regular. Precipitation events have also become more intense.⁶³ In addition, extreme weather events such as floods and droughts have been occurring more frequently in Central America in recent decades.⁶⁴

Climate change projections for the Dry Corridor estimate gradual increases in temperature, in Guatemala of up to 3° by 2050 and 6°C by 2100 from the 1980–2010 baseline period; and reductions in mean monthly rainfall by 2071–2100. The latter will be most pronounced during the rainy season, especially in the mid-summer months, and with slight increases in October and November.⁶⁵ Short-term droughts are also projected to lengthen, intensify and become more frequent during the rainy season when farmers are most dependent on reliable rainfall patterns.⁶⁶ Intensification of the mid-summer drought (*canícula*) is also expected.⁶⁷ More specifically, in moderate to high greenhouse gas emissions scenarios, short-term droughts are projected to lengthen in all months by 12–30 per cent (0.7–1.8 months) by the end of the century compared to 1950–2005, and by 11–23 per cent (0.5–1.1 months) in the rainy season. They are also projected to intensify by 17–42 per cent across all months and by 21–51 per cent during the rainy season.⁶⁸ Long-term droughts are also projected to become more severe by

⁶⁰ These are rough estimates that apply to both the Honduran and the Guatemala Dry Corridor. Focus group discussions in Guatemala and Honduras, Mar. and Apr. 2022.

⁶¹ This section benefited from data collected and analysed, and text written by Farah Hegazi from SIPRI.

⁶² Gotlieb et al. (note 3), pp. 43–44.

⁶³ Magrin, G. et al., 'Central and South America', eds Barros, V. R. et al., *Climate Change 2014: Impacts, Adaptation and Vulnerability*, Part B: *Regional Aspects*, Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (Cambridge University Press: Cambridge, UK and New York, NY), pp. 1499–1566.

⁶⁴ Magrin et al. (note 63), p. 1508.

⁶⁵ United Nations Framework Convention on Climate Change (note 9), p. 405.

⁶⁶ Republic of Honduras (note 11), pp. 144–46.

⁶⁷ Farmers have traditionally coped with the effects of the *canícula* and adapted by sowing as soon as the first rains arrive in May. They have also reaped the benefits it brings in the form of increased evapotranspiration and a reduction in pests. However, the increasing (and projected) challenge is the intensification and prolongation of the *canícula*, which results in significant crop losses as crops do not get sufficient water in key growing periods. Key informant interview and focus group discussions, Mar./Apr. 2022.

⁶⁸ Depsky, N. and Pons, D., 'Meteorological droughts are projected to worsen in Central America's dry corridor throughout the 21st century', *Environmental Research Letters*, vol. 16, no. 1 (2021), p. 10.

2100, intensifying by 27–73 per cent, depending on the scenario, across all months, and by 27–75 per cent in the rainy season.⁶⁹ Periods of ‘seasonal hunger’ in the Dry Corridor are likely to be extended, especially in El Niño years.⁷⁰ Intensification of heatwaves is also expected in some areas. These changes are anticipated to affect basic grains and coffee production because of forest fires, lags in sowing and increased pests.⁷¹ They are also expected to increase the demand for irrigation, and to lead to a transformation in agricultural systems and an expansion of the agricultural frontier.⁷²

*Farmers’ perceptions of climate change impacts and decreasing yields*⁷³

A large proportion of households in the communities visited in Guatemala and Honduras depend on rain-fed subsistence agriculture, mainly corn and beans, for their food security.⁷⁴ Changing rainfall patterns, particularly during the rainy season, are having significant impacts on agricultural productivity, mainly due to lack of rain at key periods in the crop growing cycle. More specifically, farmers recount that the start of the rainy periods has become less reliable.⁷⁵ Even once the rainy season has apparently begun, rainfall may come only briefly and not return for weeks, or there may be high amounts of rain in very short periods. The implications are that crops that have just been sown do not get sufficient water (or get too much) during key growing periods. The length of the *canícula* (midsummer drought) is also changing. Traditionally, the *canícula* lasted only a few days, up to two weeks, but in recent years farmers in some of the communities visited have experienced up to two months of midsummer drought.⁷⁶ These changes in climatic conditions are contributing to less reliable and deficient crop yields. In recent decades, and particularly in the past few years, yields have decreased significantly to the point where farmers have lost most or all of their production in some seasons.

If climatic changes continue to alter rainfall patterns, particularly the start, distribution and amount of rain during the first agricultural cycle (*primera*), more farmers will stop trying to grow during this cycle—something that is already happening in Guatemala and Honduras.⁷⁷ Reductions in crop yields mean insufficient production to cover household food needs, increasing the need of families to find alternative sources of income. In the communities visited in both Guatemala and Honduras, to compensate for the lack of funds and food linked to shortfalls in rain-fed production, male household members, for instance the male head of household or the oldest male child, would traditionally migrate seasonally for work to other parts of the country or nearby countries during the non-agricultural season and return home for the agricultural season.⁷⁸ Not producing during the *primera* as a result of decreasing yields could require farmers to increase the periods they spend away from their families and of temporary migration during the period May to August to compensate.

⁶⁹ Depsky and Pons (note 68), pp. 8, 10, 12.

⁷⁰ United Nations Framework Convention on Climate Change (note 9), p. 463.

⁷¹ Republic of Honduras (note 11), p. 157.

⁷² Data based on the projections for the Comayagua Development Region. Republic of Honduras (note 11), p. 152.

⁷³ Based on Focus group discussions in Guatemala and Honduras, Mar./Apr. 2022.

⁷⁴ In Guatemala, 97 per cent of WFP pro-resilience programme participants were at the start of the programme dependent on rain-fed agriculture and had no access to irrigation. European Union and World Food Programme (note 57), p. 13.

⁷⁵ Rainy periods would traditionally be from around the end of May until July and then from Aug. to early Nov.

⁷⁶ For example, during the *postrera* season, farmers have experienced strong rains during the blooming of bean flowers, which cause the flowers to fall off, negatively affecting yields. Key informant interview and Focus group discussions in Guatemala and Honduras, Mar./Apr. 2022.

⁷⁷ Key informant interviews in Guatemala and Honduras, Mar./Apr. 2022.

⁷⁸ Focus group discussions in Guatemala and Honduras, Mar./Apr. 2022.

Climate change and conflict in the Dry Corridor

More frequent and more intense exposure to droughts, hurricanes and other extreme events associated with climate change, and the resulting changes in agricultural production conditions and yields, are likely to increase competition for land and water. Those who own no land, among whom women are overrepresented, will be the worst affected. Competition over natural resources could lead to conflicts within and between communities and weaken community cohesion. Tensions over access to land and water are already increasing in parts of both countries, and these are likely to worsen as climate change continues.

Land tenure and conflict in a changing climate

In a changing climate, land tenure insecurity may become a source of conflict between landowners and tenants because land rental is in most cases paid for with an agreed amount of the crop yield. In years of bad yields, due to drought, excessive rain or increased pests as a result of climate variability and change, farmers may not be able to pay their rent, or all of their production may be needed to pay the rent, creating a point of contention between landowners and renters. As is further explained in the TOCs, even if farmers currently have access to land through the various land tenure arrangements discussed above, this does not mean that those who rent land have total autonomy regarding how to use it. Landowners often restrict the activities that farmers can carry out during the rental/loan agreement, for example, they might not allow soil conservation activities. Access to a plot of land through rental or loan is not equivalent to full control over resources. As noted above, even those who own land often do not own enough to meet their household's food needs but must rent additional plots, which may be subject to the same land use restrictions.

The impacts of climate change on decreasing yields provide impetus for farmers to carry out soil conservation activities as a way to adapt. Disagreements over how to use rented land and allowable activities on that land can be expected to become an increasing source of conflict between farmers and landowners.

Water access and conflict in a changing climate

Access to water is already a regular source of conflict in the communities visited, where the person who owns the land on which the water spring is located also controls the water resource and can allow or block its use by neighbours. In many of the communities visited, drinking water is not available on a continuous basis but on rotating schedules. Irrigation is also limited and where it exists, often reliant on rotating irrigation schedules within communities. This requires high levels of community organization to agree and distribute of schedules, and for the maintenance and operation of water-related infrastructure. It also requires social cohesion in the form of shared and agreed goals, and trust among community members so that the process of distributing resources is considered fair.⁷⁹

The expected reduction in water availability linked to climate change could become a source of tension between community members, particularly if water distribution schedules are deemed to favour some households over others.⁸⁰ Increasing periods and intensities of water scarcity could also exacerbate existing conflicts between communities, and those between communities and landowners over access to and use of limited water resources.

⁷⁹ Burns, J. et al., 'Defining social cohesion', *SALDRU Working Paper no. 216* (Southern Africa Labour and Development Research Unit, University of Cape Town: Cape Town, 2018), p. 4

⁸⁰ For more information on water distribution mechanisms at the community level, see the subsection 'Context' within the section 'Theory of change 2: Water-related conflict' in chapter 4 of this report.

The TOCs elaborate how these conflicts might play out, and in some cases are already happening, as well as WFP's potential role in mediating or aggravating these types of conflict. In the communities visited, these conflicts currently take the form of tensions, verbal (and on a few occasions physical) arguments, infrastructure sabotage, and the blockage of roads and other routes from one community to another. While violence as a result of water- and land-related conflict is not a significant issue in these communities, decreasing yields and water availability could change this.

3. The Central American Dry Corridor case study

This research has taken a regional approach, covering the Central American Dry Corridor with a particular focus on WFP's FFA resilience programming in Guatemala and Honduras. The research questions that guided this climate change deep dive were:

1. What is the intersection between the impact of climate change and risks to social and political stability or of social tensions?
2. Whether, how and to what degree WFP's programming enhances resilience or inadvertently contributes to tensions or conflict.
3. How does WFP programming contribute to improving the prospects for peace?

The research was conducted in communities considered part of the Dry Corridor in the departments of Zacapa and Chiquimula in Guatemala and in the departments of La Paz and Santa Barbara in Honduras. The specific communities visited are listed in table 3.1. The communities are all small villages or hamlets in these municipalities.

Method

The research involved a review of WFP programme documents and the literature on Guatemala, Honduras and the Dry Corridor, discussions with 17 WFP headquarters, regional bureau and country office staff, and eight in-depth interviews with a range of stakeholders. Data was collected during research in Guatemala on 21–25 March 2022, during which five focus group discussions (FGDs), three narrative walks and four group meetings were held in the departments of Chiquimula and Zacapa. In Honduras, data was collected between 28 March and 1 April 2022, during which six FGDs, three narrative walks, three community guided short visits to WFP supported community projects and three in-depth meetings were held in the departments of La Paz and Santa Barbara. The data collected was analysed and used to develop two TOCs that articulate how WFP can help to increase the prospects for peace through specific programmes, identify conflict sensitivity concerns and provide actionable entry points.

Limitations of the study

Some limitations of the study are acknowledged. Most of the narrative walks and FGDs took place near where people live and not necessarily where they carry out their agricultural activities or where they collect water for consumption and irrigation. This limited the ability to complement the information from the research participants with observations. It also limited the ability to deepen some of the issues raised in the discussions. However, the FGDs and narrative walks that took place in the agricultural fields and to sources of water (water springs) helped confirm, and provided context and depth to, the discussions held elsewhere.

Table 3.1. Communities visited or spoken to during fieldwork in Guatemala and Honduras, March to April 2022

Community	Municipality	Department
<i>Guatemala</i>		
El Jute	Huité	Zacapa
Sinaneca	San Jorge	Zacapa
Cerro Chiquito	Zacapa	Zacapa
Plan Jocote	Chiquimula	Chiquimula
San Juan Ermita	Chiquimula	Chiquimula
<i>Honduras</i>		
Cerro Verde	Marcala	La Paz
Tres Cruces	Marcala	La Paz
El Borbollón	Santa Elena	La Paz
Las Mercedes	Mercedes de Oriente	La Paz
Jardines ^a	Opatoro	La Paz
San José de Tarros	Nueva Frontera	Santa Bárbara
Barranco	Nueva Frontera	Santa Bárbara

^a This community was not visited but a focus group discussion with intended beneficiaries took place in Las Mercedes.

WFP Interventions in Guatemala and Honduras

The research focused on FFA resilience programmes in Guatemala and Honduras.⁸¹ In both countries, there was a mix of communities where WFP interventions had been taking place over the course of several years, and intended beneficiaries had participated in at least one project prior to being selected to participate in the current one, and communities where WFP had arrived more recently, in the past one or two years. This mix of longer- and shorter-term intended beneficiaries provided insights into the impacts of WFP interventions on communities over time.

WFP Guatemala has been implementing FFA resilience-building programmes in the Dry Corridor since 2014. In 2016 it began implementation of the regional ProAct project in response to the El Niño phenomenon in the Central American Dry Corridor, which included communities in Guatemala and Honduras. In Guatemala, WFP is currently implementing a follow-up project to ProAct called ProRes.⁸² ProRes seeks to build resilience by increasing productivity and the adaptive capacity of communities vulnerable to food insecurity and climate shocks, especially drought; and to reduce chronic malnutrition and food insecurity. The research focused on this project in Guatemala.

WFP in Honduras has been implementing resilience building programmes since 2012. FFA resilience programming in Honduras has taken a community resilience focus, whereby WFP supports the formation of a group among intended beneficiaries in the same community to carry out joint asset creation activities.⁸³ A condition of receiving funds as part of this type of programme is that a member of the intended beneficiary's household must be part of the community group and actively contribute to group activities linked to asset creation.⁸⁴ A number of projects have taken place in La Paz since 2012, particularly targeted at Lenca indigenous communities. In the Santa Bárbara department, WFP is implementing a recovery response project to support communities recovering from the hurricanes Eta and Iota in 2020. This project is a pilot project to test bridging post-disaster recovery with resilience building.

⁸¹ WFP's Food for Assets assistance provides unconditional cash, vouchers or food transfers while communities build or rehabilitate assets with the aim of improving long-term food security and resilience. See WFP, 'Food for assets', [n.d.].

⁸² Both ProAct and ProRes were financed with support from the European Union.

⁸³ The idea behind community resilience projects is that they are more sustainable and contribute to greater sharing of risk than individual approaches to resilience.

⁸⁴ Key informant interview with Honduras WFP Country Office and field staff, Mar./Apr. 2022.

4. Findings

This section analyses how climatic shocks and stresses affect food security and the risk of conflict, and how WFP can reduce or exacerbate the potential for conflict through its FFA resilience programmes in the communities visited in the Dry Corridor of Honduras and Guatemala. Two theories of change are proposed for how WFP can improve the prospects for peace in the Dry Corridor through its programming: one related to land tenure and a second related to water governance.

Theory of change 1: Land tenure insecurity in a changing climate

*If access to stable land tenure agreements on agricultural land can be facilitated, which include the right to use the same plot of land for several years and to determine how to use it, **then** tensions between farmers and landowners and among community resilience project intended beneficiaries can be reduced **because** farmers will be able to carry out soil conservation activities on the same plot of land and reap the benefits of improved crop yields, increasing their food security and their ability to pay for rented land.*

Context

As noted above, land tenure insecurity is a severe challenge in the Dry Corridor. Climate change might exacerbate land insecurity, leading to conflict between land insecure farmers and landowners, as reduced crop yields diminish the ability of farmers to pay the rent on their land. In addition, climate change makes soil conservation activities imperative in order to increase resilience to both drought and storms.

Through its FFA Resilience Programmes in the predominantly agricultural communities of the Dry Corridor, WFP engages both directly and indirectly with land tenure issues. These engagements have the potential to contribute to improving the prospects peace, but they could also inadvertently stoke conflict. The conflict sensitivity risks of WFP interventions must therefore be considered.

Analysis

Land tenure insecurity, food insecurity and conflict in a changing climate

Agricultural yields have generally decreased in the past decade or so, due to a combination of environmental degradation and climate change. The WFP Food for Assets Resilience Programmes analysed in this study involve technical support with carrying out soil conservation activities to improve yields. The farmers who have applied soil conservation activities have experienced improved yields.⁸⁵ However, the limited amount of agricultural land available to intended beneficiaries means that, even under current climatic conditions, most farmers cannot produce enough food to meet a household's needs year round. To address this problem, WFP has also supported non-agricultural livelihoods (see below).

Constraints on soil conservation activities. In Guatemala, in the communities in the Zacapa department, individual households carry out asset creation activities linked to agriculture. Those who own land implement asset creation activities on it. A few that do not own land have agreed with the landowners that soil conservation activities,

⁸⁵ For farmers who have carried out soil conservation activities through ProAct and ProRes programmes, yields per hectare range between 17 and 24 *quintales*; for those who have not carried out soil conservation the range is between 8 and 10 *quintales* per hectare. Key informant interview, WFP Guatemala field staff, Mar. 2022.

such as trenches and dead and live barriers, can be carried out on the rented land. However, a large number of participants who rent land stated that landowners do not allow them to undertake soil conservation activities on rented land, one reason being that they might want to use it for cattle in the future. In addition, the allocation of rental plots can vary from season to season, which could mean that those carrying out improvement activities might not directly benefit from the improved yields resulting from soil conservation. This is particularly relevant since WFP's asset creation activities on land focus on soil conservation and restoration, which require long-term investment of time and effort—at least a few years—to produce clear, compounding benefits.

Those who were unable to use their productive land for asset creation activities used their home gardens, but this should be considered just demonstration work to fulfil WFP's FFA requirements rather than a direct contribution to the resilience of production. While the farmers are still learning their skills, a slight sense of frustration could be perceived because they could not implement the practices learned on the land they worked. This could affect the attitude of intended beneficiaries to WFP programmes if they are unable to reduce their food insecurity because of their inability to implement improved agricultural practices.⁸⁶

Inability to pay for rented land. Land tenure insecurity can become a source of tension between landowners and renters in a changing climate because farmers who do not own land usually pay the rent due in crop yields. This means that in years of bad yields, most of their production may need to go on land rental payments.

Some families in Zacapa and Chiquimula, Guatemala, told how in lean years the landowner gave them more time to pay, allowing them to gain money through daily waged labour, for example, on melon plantations. Other families declined to pay the rent since they could not afford it and could not get enough work to cover the food needs of their family and the rent. In such cases, some landowners forgave the debt, while others refused to rent the land to the household for the following cycle.⁸⁷ Increasingly unreliable and changing rainfall patterns that negatively affect yields could increase tensions between landowners and renters.⁸⁸

WFP's contributions to peace and conflict sensitivity

WFP has devised a number of alternatives in its FFA Resilience Programmes in the Dry Corridor to circumvent land tenure challenges. For example, WFP has supported communities in Guatemala and Honduras to work together on a shared piece of land that the group borrows, rents or buys. WFP's involvement has been around incentivizing intended beneficiaries to work as a group on asset creation activities, and to provide technical support on how to carry out soil conservation activities and how to jointly work the borrowed or rented land. It is the responsibility of the groups to find a piece of land in the community (or nearby) that they can use to work jointly and make the necessary agreements with the landowner, as well as to define working arrangements within the group.

In Chiquimula, for example, a group had started asset creation activities on land borrowed from a landowner who did not live in the area. He agreed to let the group use it free of charge for a few years. Soil conservation activities were carried out jointly on the entire piece of land. The land was distributed so that at the time of cultivation each

⁸⁶ Focus group discussions and narrative walks, Guatemala, Mar. 2022.

⁸⁷ Focus group discussions in the departments of Zacapa and Chiquimula, Guatemala, Mar. 2022.

⁸⁸ Negatively affected yields refers to decreased crop productivity/hectare.

member would be responsible for sowing and harvesting their assigned plot, In other words, only the soil conservation activities were being done jointly, and the rest of the production cycle was carried out by individual households. Group members told how group work was helping to build social cohesion, and that this was something new as they were not used to working together on productive activities, or more generally engaging in joint work. Social cohesion is being built by defining common goals, and sharing learning processes and work, as well as sharing the benefits of the joint work. Communal work has also helped to ease the burden of physically demanding activities such as building stone barriers, since men and women worked together to lift heavy rocks.

In Honduras, the focus of WFP's resilience programmes has been on building community resilience. In practice, this means that intended beneficiaries need to form a group and find a piece of land on which to work together. In some communities, such as Cerro Verde, there has been significant progress on joint working and intended beneficiaries have even developed a group-based rural credit union (*caja rural*), which serves as a loan association using the profits from sales from group agricultural activities as seed funding. The board members of the rural credit union, who are elected from among the group, purchased a small piece of land to build a greenhouse and a collection centre, where products are collected to take to market and established buyers can come to collect agricultural products. The profits from the sale of these products are distributed so that a proportion is used to capitalize the bank, another to buy agricultural inputs and the rest is shared among the members of the credit union. The rural credit union in Cerro Verde prioritizes providing credit to individual farmers for agriculturally productive projects. This provides an incentive and the financial resource to farmers in the community. It also prioritizes funding community members, even if they are not WFP intended beneficiaries, which helps to reduce tensions between group and non-group members in the community.

In Honduras, the most successful communities at group activities are those that have managed to diversify production and sell their products, and to combine joint and individual work so that group work does not consume so much time that this becomes a deterrent. Among the key factors in the success of these communities were stable access to a plot of communal land, and access to irrigation, which allowed them to diversify production more easily, produce year round and accommodate the production of profitable crops with secure markets (see TOC 2).⁸⁹ Rural credit unions were also an important component of the success of group work. Communities with well-organized rural credit unions had access to savings and profits distributed from loan interest. The potential for savings meant that they were able to purchase a joint piece of land on which to produce products for sale, which reduced the challenges linked to insecure land tenure.

These examples show that WFP is contributing to peace in two ways: helping to build social cohesion through group activities and providing technical support to groups on the creation of rural credit unions. WFP is indirectly helping farmers get access to credit, which is not normally available to landless farmers from financial institutions, and this reduces issues around non-payment of rent for land. The profits from credit also allow group members to purchase land jointly, thereby reducing land tenure insecurity and associated conflicts. Furthermore, WFP is reducing the risk of tensions between intended beneficiaries and non-beneficiaries that can arise from non-beneficiaries feeling left out, as rural credit unions are accessible to all members of the community regardless of their involvement with WFP.

⁸⁹ One of the communities had established a stable trading relationship for herbs with buyers from El Salvador.

Potential avenues for addressing land tenure conflicts

WFP does not work directly with landowners and has no mandate to address land tenure issues. Its contribution to farmers' land access and tenure arrangements is therefore limited. However, as a large proportion of its intended beneficiaries rent the land they farm, WFP could try to reduce conflicts related to land insecurity by attempting to partner, or at least engage with, the larger landowners who rent land to intended beneficiaries. This engagement could be about *demonstrating* the benefits of soil conservation activities for both landowner and intended beneficiary in terms of improved soil chemical conditions, reduced erosion and increases in the effectiveness of arable land by clearing out rocks, for example, to build dead barriers, all which can lead to increased yields. Engagement could also be about facilitating stable and formal rental arrangements so that intended beneficiaries can enjoy the medium- to long-term benefits of soil conservation activities. In addition, it could be about including landowners or informing them about the benefits of risk transfer initiatives, such as parametric micro-insurance programmes, that are being piloted, for instance, in Guatemala. These reduce economic losses in a bad yield year, helping intended beneficiaries to maintain their rent payment commitments. Given the risk of farmers losing the land they rent if they are unable to pay their rent following a low yield, including micro-insurance schemes as part of the FFA Resilience Programme and supporting the payment of premiums, at least in the early years, could be a positive step for WFP to take.⁹⁰

Recommendations*During project preparation*

1. Wherever possible, WFP should try to partner, or at least engage, with the larger landowners who rent land to intended beneficiaries. These partnerships or engagements could aim to raise awareness about the benefits of soil conservation activities while also facilitating land rental agreements with clear and stable conditions.
2. In the case of group agricultural activities, WFP should facilitate and support the development of clear borrowing or land rental agreements, in written form, with the landowner; and develop a group transition strategy for when the borrowing arrangement ends. This would reduce the potential for conflict between landowners and renters while also providing a sustainability strategy for the continuation of group activities beyond WFP interventions.
3. WFP should continue to support livelihood diversification both agriculture and non-agriculture-based. Increasing negative impacts on yields due to climate change may require a particular focus on non-agricultural livelihoods during non-agricultural periods to reduce the need of family members to seasonally migrate. It would also require risk transfer mechanisms such as micro-insurance schemes, which would provide a payout in case of climatic shocks affecting crops.

⁹⁰ Micro-insurance risk transfer programmes are just starting to be designed or piloted in a few of the communities visited in Guatemala and Honduras. In Guatemala, WFP covers 100% of the cost of the premium in the first year, and if community members are able to they pay a proportion of the premium in the second year (10–20%). The amount covered by the community members is expected to increase in subsequent years. However, this depends on the community and individual context. In some communities, WFP was still paying 100% of the premium in year two. WFP Guatemala staff, July 2022.

During project implementation

4. For group agricultural activities on jointly worked land, WFP should facilitate group working arrangements to ensure that the amount of work and time required is reasonable, and that all the intended beneficiaries understand the potential short-, medium- and long-term benefits. In this way, tensions among group members and dropout rates can be reduced.
5. In addition to working arrangements, WFP should include the development of gender inclusive conflict prevention and management mechanisms as well as shared decision-making mechanisms to reduce the risk that the group tensions mentioned above might escalate. This needs to be accompanied by related capacity building.
6. WFP, in partnership with national and local government, should support the development of irrigation systems on land that has been purchased or rented by groups, and where the owner has agreed to carry out soil conservation activities and other investment. Irrigation provides an opportunity to diversify and commercialize crops, which can help to increase farmers' resilience and be an economic incentive to remain in the group.⁹¹

Theory of change 2: Water-related conflicts

*If the management of key water resources takes an integrated watershed management approach that takes account of different users—intended beneficiaries and non-beneficiaries both within and outside the community—and this multi-actor integrated approach is incorporated into the design and implementation phases of WFP FFA resilience programmes, **then** the risk of water-related conflicts within and between communities over access to or the management of the resource could be reduced.*

Context

Under current conditions of climate variability, communities in the Dry Corridor are struggling to access water for consumption and irrigation. Communities identify water access as one of their biggest challenges and sources of vulnerability.⁹² As noted above, climate change is expected to reduce water availability and increase the length and intensity of droughts, putting additional stress on communities.

Sources of water

Most of the communities visited in Guatemala and Honduras rely on a community-based solution for drinking water, that is, there is no municipal or state infrastructure for bringing water to the communities.⁹³ The majority of the communities take water

⁹¹ WFP has experience of supporting common water management mechanisms in other countries and in partnership with other UN agencies. For example, in a transboundary watershed between Kyrgyzstan and Tajikistan, WFP used its FFA programme to support the development of the infrastructure required for water utilization when communities on both sides of the border needed the resource. WFP and other UN agencies also used aspects of the programme to strengthen conflict resolution capacities and community leadership of the project. WFP Panama Regional Office staff, June 2022.

⁹² The issues of access to water and water deficiency have been highlighted in several of the seasonal livelihood assessments. See e.g. WFP Guatemala, Consulta Estacional de Medios de Vida Municipios de Chiquimula y Olopa Departamento de Chiquimula, República de Guatemala [Seasonal Livelihood Survey in the Municipalities of Chiquimula and Olopa in the Chiquimula Department, Guatemala], 26–30 Oct. 2020, pp. 17–18, 24.

⁹³ Some of the materials for the community infrastructure were bought with government support.

Table 4.1. Estimated access to irrigation from communal and individual irrigation systems in the Department of La Paz, HondurasIn tareas (437 m²) and hectares

Community	Communal system: irrigated area ^a	Individual land: irrigated area ^b
Cerro Verde	23 (1.0 ha) ^c	0
El Borbollón	16 (0.7 ha)	6 (0.26 ha)
Tres Cruces	11 (0.48 ha)	0
Las Mercedes	3 (0.13 ha)	0

^a Communal system refers to irrigation systems with a communal water intake and a distribution pipeline to a tank. Water from the tank is used for drip irrigation systems on the individual plots of community members. The World Food Programme (WFP) together with USAID (in the context of the Dry Corridor Alliance) provide funds for irrigation systems infrastructure and materials, including the drip irrigation pipes to the individual plots.

^b Individual land refers to irrigation systems on intended beneficiaries' land but purchased and installed with sources of funding other than WFP funding.

^c 21 intended beneficiaries are part of the community resilience project; most own 1 tarea of land and two own 2 tareas.

Source: Data collected verbally from intended beneficiaries by WFP field staff in La Paz Department, Honduras, May 2022.

from a nearby spring; some springs are not so nearby, being outside the municipality and several kilometres away.⁹⁴ A few communities have built irrigation systems, such as infrastructure to collect and transport water from nearby springs or irrigation infrastructure for fields and greenhouses. These investments have been partially funded with support from international organizations such as WFP.

The availability of drinking water for households varies between communities and is highly dependent on the source of the water and the water distribution schedules designed by communities. Drinking water availability in the communities visited in both countries ranges from an almost 24-hour supply to homes to a few hours per day or, in the worst cases, a few hours per month. Availability also varies between seasons, with significant reductions in amount and level of access during dry periods. Some communities do not have piped water to the community so household members (usually women) must walk several kilometres to collect water from streams.

The governance of water resources is often the main source of *conflict* within and between communities,⁹⁵ particularly in the Dry Corridor context where water resources can be scarce and communities often share a water source. Water springs can be either on communal land managed by the local or national government or on private land.

While it might be assumed that communal land provides an entry point for easier water sharing arrangements, the reality is that much of the communal land has been given to or appropriated by the large landowners, even if officially the land retains communal title.⁹⁶ For farmers, the appropriation of communal land by big landowners is a source of mistrust of local and national authorities and feeds a sense of unfairness in the distribution of resources. This sense of unfairness has not resulted in demonstrations or protest in these communities, but it has in other parts of both countries.⁹⁷ Some communities have contacted the authorities, and even lawyers, to claim access to a water source (see below).

In some cases, a community has bought the piece of land on which the spring is located; in others, the land is owned by one community but several communities use the water. Sometimes the land is owned by a big landowner. In the latter case, either

⁹⁴ All the communities visited depend on surface water. There was no evidence of use of groundwater.

⁹⁵ The communities are small villages or hamlets, and several of the examples of conflict raised in this section occurred between communities that are part of the same municipality. In a few cases the communities in conflict belong to different municipalities or even departments.

⁹⁶ Group discussions in Zacapa department, Guatemala, and La Paz, Honduras, Mar. 2022.

⁹⁷ Navas, Mingorria and Aguilar-González (note 27); and Centro de Estudio para la Democracia (note 52).

the landowner has given access to the resource to a community or the community takes the water but no agreement is in place, making access to the resource unreliable and a potential source of conflict.⁹⁸

Irrigation: Part of the peace and conflict puzzle of water governance

Irrigation is a key aspect of increasing the resilience of communities, where WFP or other actors are able to support such infrastructure. Community members who have been able to install irrigation have increased their yields. They are not limited to cultivating during the rainy seasons (rain-fed agriculture) but can cultivate all year long. Irrigation also gives them the opportunity to diversify crops, which has had added nutritional benefits linked to the diversification of diets, as well as economic benefits by allowing the commercialization of some production. In Honduras, for example, as noted above, intended beneficiaries of community resilience projects who have access to irrigation on joint and individual plots have used part of the profits from selling their crops to create and continue to capitalize their rural credit union.

However, access to irrigation is very limited. At the start of ProRes in Guatemala, 97 per cent of intended beneficiaries' production was rain fed.⁹⁹ Since then, the programme has supported the rehabilitation of two hectares of mini-irrigation systems.¹⁰⁰ Table 4.1 shows the low level of access to irrigation for communal and individual systems by intended beneficiaries in La Paz, Honduras. Several factors influence the low levels of irrigation in both countries. There may be limited access to water sources, which is often the result of limited access to land, or communities might prioritize drinking water provision over irrigation because irrigation projects are costly and few institutions—either local or international—are willing to finance them. Finally, without title to the land, farmers cannot access credit from financial institutions.¹⁰¹

Analysis

WFP FFA Resilience Programmes in Guatemala and Honduras have directly and indirectly influenced access to water by their intended beneficiaries for both drinking and irrigation. Directly, WFP has provided funds to communities and responsible government institutions for the material to build water-related infrastructure (e.g. grey infrastructure including dams, water intakes, pipes and irrigation systems). It has also facilitated water governance arrangements at the watershed level, and supported watershed conservation, restoration and protection activities. Many springs are located on private land and it is therefore the owner of the land who controls the allocation and use of the resource. In some communities, the community has bought the land on which a spring is located and the community water board is in charge of protecting and managing the resource and related water infrastructure.¹⁰² In Honduras, for example, although the General Water Law, Legislative Decree 181-2009 of 2009, establishes that water resources belong to the state and their management shall depend on the Government of Honduras, state presence in rural areas is limited in practice and private sector actors often control water resources

⁹⁸ Key informant interviews, focus group discussions and narrative walks in Guatemala and Honduras, Mar. and Apr. 2022.

⁹⁹ WFP Guatemala, 'Reporte final línea base ProRes' [ProRes baseline final report], 2021, p. 13.

¹⁰⁰ WFP Guatemala, PowerPoint presentation, 'Actividades de Resiliencia en Guatemala' [Resilience activities in Guatemala], Mar. 2022. As part of ProRes, WFP Guatemala has hired experts to assess the feasibility of supporting additional irrigation systems in 2023.

¹⁰¹ Key informant interviews and group discussions in Guatemala and Honduras, Mar. and Apr. 2022.

¹⁰² Focus group discussions and Key informant interview, WFP field staff, Guatemala and Honduras, Mar./Apr. 2022.

on their land.¹⁰³ Indirectly, FFA cash-based transfers and the funds earned through the commercialization of crops and rural credit unions have allowed communities to save money to collectively buy the land around water springs and intake points, and to build water-related infrastructure.¹⁰⁴

Limited access to water has become, and is expected increasingly to be, a source of tension within and between communities. Through its FFA Resilience Programmes, WFP could play a significant role in helping to reduce such tensions (see below). At the same time, through its support for community-based water infrastructure, WFP could also be taking sides and inadvertently contributing to those conflicts.

This TOC is developed around two kinds of conflicts: those *within* and those *between* communities. Here, conflict refers to tensions, disagreements and even infrastructure sabotage such as blocking roads and pathways rather than violent conflict.

Conflicts within communities

Community-based water allocations: Schedules

Each community has an elected community-based Water Board, usually composed mostly of men, which determines the number of hours a household can have to collect water from the tap at home or from a collection point in the community, as well as the schedule for water collection. In most of the communities visited, community members had no issues with the allocated water schedules, even if those that took their turn in the afternoon, for example, were able to collect less water than other households. In a few communities, however, people raised concerns about having limited access to water because of the allocated schedule.

In a few of the communities in Honduras that are part of community resilience activities, WFP has also supported irrigation-related infrastructure for the land that is worked jointly. Some communities have also managed to extend irrigation infrastructure to the individual plots of intended beneficiaries. In these areas, groups have also agreed on irrigation schedules. WFP has contributed to increasing the resilience of some of these communities and to avoiding conflicts by supporting the construction of community water collection tanks, which contribute to an even distribution of water during irrigation schedules and provide a reserve in periods of water shortage.

Climate change is expected to reduce water availability, putting increased stress on households. This could become a source of tension between community members over time, particularly where water access schedules might favour some households over others. While this is not yet a significant issue, this is likely to change with decreasing water availability.¹⁰⁵

WFP's potential contribution to peace: Outcomes around water schedules

WFP could help to ensure that water schedules do not become a source of tension through the simple solution of promoting a rotating schedule for drinking water. Households would have access to water at different times throughout the week (or

¹⁰³ Government of Honduras, Office of Natural Resources and Environment, *Mi Ambiente: Plan Nacional de Reducción de Riesgos por Sequía, 2020–2038* [National Plan for the Reduction of Drought Risks, 2020–38], Sep. 2020, p. 47.

¹⁰⁴ It should be noted that preliminary unpublished analysis of recent ProRes Post-distribution Monitoring (PDM) shows that only about 30% of intended beneficiary households save any of their cash-based transfer and that most of the cash is used for food, hygiene products and health services, which reflects the challenges households and communities face when saving for water-related purposes. Data provided by WFP Guatemala staff, Aug. 2022.

¹⁰⁵ See e.g. water-related conflicts in Costa Rica, where conflicts over scarce water resources have turned violent. Kuzdas, C. et al. 'Identifying the potential of governance regimes to aggravate or mitigate local water conflicts in regions threatened by climate change', *Local Environment*, vol. 21, no.11 (2016).

month), providing a better balance of water access between households. Similarly, rotating schedules for irrigation could also guarantee a fair distribution of water resources and avoid conflicts in the future. As the bodies that assign the schedules, community-based Water Boards are the entry point for this recommendation. The board members are mostly men but, as noted above, it is often women who collect water either from collection points or streams. In addition, due to existing social norms on gender which designate household tasks to women, it is usually women who are directly in charge of using the water collected. The issue of increasing women's participation in Water Boards and other community-based decision-making committees should be promoted and facilitated as part of the capacity building on gender, community participation and leadership that many FFA Resilience Programmes provide.

Wherever possible, providing funds or materials for rainwater collection would also help to ease the burden of water-scarce communities and reduce the potential for community tensions during prolonged dry periods. WFP has already supported some communities through the provision of home-based water tanks, for example, through ProAct in Guatemala. Funding or materials for rainwater collection was a common request from community members.¹⁰⁶

Community-based monitoring and maintenance of water infrastructure

Community Water Boards also determine who is responsible for monitoring and the maintenance of water infrastructure, and how this is done. In some communities in Guatemala, for example, groups were assigned to monitor and undertake the necessary maintenance and repair of water infrastructure for two weeks at a time on a rotating basis. This set-up was put in place several decades before WFP's intervention, and all the households in the community were included on the maintenance schedule. In other communities, only board members take care of maintenance, while in others one community member is made responsible for maintaining the water infrastructure and paid for the work.

In communities where responsibility is shared, the group work is a source of social cohesion through the time spent monitoring the water infrastructure, and learning and working together to repair it. It is also a way to develop transferable skills, share responsibilities, avoid conflicts and reduce individual blame when problems occur.¹⁰⁷

WFP's contributions to peace through community-based water governance

WFP can also play a role in contributing to peace in community-based water governance by promoting shared water monitoring and maintenance arrangements in its intended beneficiary communities.¹⁰⁸ The increase in the number and intensification of extreme weather events, such as droughts, heavy precipitation and hurricanes, means that damage to water infrastructure could become more common. Increased participation by community members (both intended beneficiaries and non-beneficiaries) in the monitoring and maintenance of infrastructure could increase the resilience of the communities by increasing the awareness of community members of water-related issues from climate related impacts on water and potential coping strategies for water resource management and water infrastructure repair. This could become a source of increased social cohesion by bringing people together to plan and carry out common tasks with a shared goal. In addition, it could become a source of transferable vocational and decision-making skills related to water infrastructure and watershed management. The decision-making skills learned through the planning and distribution

¹⁰⁶ Focus group discussions in Guatemala and Honduras, Mar./Apr. 2022; and various seasonal livelihood assessments by WFP Guatemala, for example WFP Guatemala (note 92).

¹⁰⁷ Focus group discussions and narrative walks in Guatemala and Honduras, Mar./Apr. 2022.

¹⁰⁸ Kuzdas et al. (note 105).

of tasks in group-based monitoring and maintenance activities could be transferred to other community-based and municipal decision-making institutions such as planning committees.¹⁰⁹ They could also help to avoid conflicts in times of scarcity and reduce the pressure on board members to be solely responsible for resolving the increasingly challenging issues around water access as a result of climate change. The involvement of women in these activities should also be encouraged as it is currently considered a man's responsibility because of the physically demanding nature of some of the tasks. Monitoring and maintenance groups with a mix of men and women would combine the different planning and physical strengths that individuals possess.

Conflict sensitivity: Beneficiary and non-beneficiary tensions over water access

Water-related tensions or conflicts have occurred between intended beneficiaries and non-beneficiaries in the same community in several of the communities visited. In Honduras, for example, conflicts have emerged between community resilience intended beneficiaries and non-beneficiaries over the use of water. In La Paz, group members use a source of water within the community to irrigate the shared greenhouse (*Casa Maya*) and to fill the tilapia fishpond they have built with WFP funds. A non-beneficiary community member who lives upstream regularly blocks and diverts the water to prevent the group from using it. The conflict and the recurrent water access interruptions have continued for several years. Group members are in the process of engaging legal representation to help resolve the conflict.¹¹⁰

This example shows that WFP needs to be sensitive to the conflicts that can arise between intended beneficiaries and non-beneficiaries in the same community over use of the resources required for WFP interventions, in this case, water to irrigate crops and to fill a fishpond. Ensuring that non-beneficiaries are included in dialogues during the design phase of interventions and jointly developing conflict resolution mechanisms that involve the whole community (both intended beneficiaries and non-beneficiaries) are both good practice to reduce this sort of conflict.

Water-related conflicts between communities

In addition to issues between community members and large landowners, the constraints on water resources discussed above have also been the source of conflicts between communities over access to a shared resource. Such conflicts comprise disagreements over land tenure to water springs, the distribution and use of water in a shared watershed, for example, between upper and lower watershed communities; and the use of the land near water springs. These conflicts can materialize when one community blocks the water intake of another, diverts water flows or blocks the passage of non-community members' access to land, to give just a few examples. These conflicts have not turned violent but have, on several occasions, required the intervention of municipal or national authorities as well as legal counsel.

A community in the Zacapa department in Guatemala, for example, depends on water originating from a spring in the neighbouring department of Chiquimula. Conflicts have taken place over the shared resource in the form of verbal disputes, threats and infrastructure disruption and sabotage. The disputes reached the point where municipal governments had to intervene to de-escalate the conflict and facilitate negotiations over the distribution and shared use and protection of the watershed.¹¹¹

¹⁰⁹ Such as COMUDES, the municipal development councils in both countries; and COCODES and CODECOS, the community development committees in Guatemala and Honduras, respectively.

¹¹⁰ Focus group discussions in La Paz, Honduras, Mar. 2022.

¹¹¹ Focus group discussions in Zacapa and Chiquimula departments; and Key informant interview, Mar. 2022.

WFP's contribution to peace: Conflict reduction and resolution between communities

WFP has contributed to the resolution of some of these conflicts by providing communities with legal counsel, supporting relevant national institutions' interventions on a contested watershed or assisting the development of watershed management plans. In Honduras, WFP has tried to work in communities that have their own water access point. Where that is not the case, however, WFP has attempted to help to develop watershed management and utilization agreements using the Honduran watershed management policy as a guiding framework.¹¹² When the water source is located on private land, WFP facilitates processes to develop water use agreements between the landowner and the community. Such processes are difficult and lengthy, and this can limit the scope of projects if WFP aims to avoid making water-related infrastructure investments before agreements have been reached. Furthermore, it is estimated that negotiation processes are successful only in around 50 per cent of cases, meaning that no water use agreement is reached in half of cases.¹¹³

For example, in the Department of La Paz, Honduras, a conflict arose between an intended beneficiary community and a family that claims ownership of the land where part of the micro-watershed used by the community is located. WFP supported the community to make a watershed declaration in partnership with the National Forest Conservation Institute.¹¹⁴ The declaration, however, does not include distribution of water rights and uses. Nonetheless, with the declaration in place, the community was able to claim the right to use the watershed for consumption and irrigation, and the family that claimed the land accepted the community's water rights.

There is also evidence of WFP trying to facilitate water use agreements in Guatemala. In the Chiquimula Department, for example, WFP is trying to facilitate dialogue among community members and landowners to expand water user rights to a spring from a small number of people, not all of whom are WFP intended beneficiaries, to a greater number of nearby community members. There has been no willingness among existing users to renegotiate water use rights. One limitation on WFP's facilitation role is the fact that WFP's intended beneficiaries have limited negotiating power vis-à-vis the powerful landowners who are some of the water users. Furthermore, WFP has had only limited engagement with big landowners in local communities. One suggestion by WFP staff was to expand WFP's partnerships during the design and implementation phases, by including nearby large landowners in the projects.¹¹⁵ This inclusion could obviously not be as direct intended beneficiaries, but it could take the form of partnerships or getting involved in employment and asset creation initiatives.¹¹⁶ Given the issues related to land tenure in TOC 1, this would be a challenging undertaking. Further research might be required to identify feasible entry points and potential win-win solutions that incentivize the participation of big landowners in such partnerships.

Increasing intended beneficiaries' empowerment through capacity building on negotiation skills and gender-sensitive conflict prevention and management mechanisms would also be an important addition to FFA Resilience Programmes.

¹¹² National Forest Conservation Institute (Instituto Nacional de Conservación y Desarrollo Forestal, Áreas Protegidas y Vida Silvestre, ICF), *Estrategia Nacional para el Manejo de Cuencas Hidrográficas en Honduras* [Honduran watershed management strategy] (ICF: 2011).

¹¹³ Key informant interviews, WFP staff, Honduras, Mar. 2022.

¹¹⁴ WFP signed an agreement with the National Forest Conservation Institute to support it financially to develop several micro-watershed declarations in communities where WFP works in the Department of La Paz. A micro-watershed declaration is a certificate of protection given by the institute that covers, among other things, a watershed management plan on reforestation, fencing off the water intake and setting a threshold for how close agriculture and cattle can get to the water source. Key informant interview, WFP field staff, Honduras, Mar./Apr. 2022.

¹¹⁵ Key informant interview, WFP staff, Guatemala, Mar. 2022.

¹¹⁶ For additional suggestions on how engagement with large landowners could take place, see the section 'Theory of change 1: Land tenure insecurity in a changing climate' in chapter 4 of this report.

WFP could partner with organizations that specialize in negotiating and conflict resolution for these activities.

An important next step to increase WFP's peace outcomes in relation to water would be to support the development of clear water use agreements that consider different seasons and scenarios, and a clear timeframe, as well as contingency plans for periods of scarcity. Where technical support, such as from national universities or research institutes, and the necessary data are available, the inclusion of climate scenarios would be an asset. When this is not possible due to issues such as insufficient funding, time or data, WFP could use the results from the seasonal livelihoods assessments that include information on good and bad yield years to inform the dialogues. In such cases, an important complement would be to define timeframes (medium and long term) when agreements would be revisited and revised to account for changes in social (e.g. population) and environmental conditions (e.g. significant changes in the seasonal availability of water). While the latter might not fully take account of the impacts of climate change in the short, medium and long term, it could ensure that opportunities for revision of the agreements are put in place over time. This would reduce the risk of developing agreements with no timeframes that become unattainable as climatic and societal conditions change.

Supporting nature-based solutions and the protection, conservation and sustainable management of water resources are important aspects of improving the health of watersheds and agricultural landscapes. This can be an indirect contribution to peace by reducing stresses on watersheds, thereby reducing the risk of conflicts over poorly managed, polluted and deficient water resources. WFP supports watershed restoration activities and should continue to support watershed protection and watershed management initiatives, which bring environmental and social benefits to intended beneficiaries and non-beneficiaries. It should also support nature-based solutions for agriculture that contribute to water harvesting, soil conservation and nitrogen fixation, such as no-till practices, agroecology, combining row crops with cover crops, and integrating native flora into cattle pastures and agriculture landscapes, to name just a few.¹¹⁷

Despite the challenges linked to developing irrigation systems mentioned above, the benefits experienced by WFP intended beneficiaries in combination with the impacts of a changing climate on crop yields from rain-fed agriculture make a strong case for the importance of WFP's support of such systems, by funding infrastructure inputs as part of FFA Resilience Programmes and by providing financial and technical support to the responsible authorities. In addition, irrigation systems have potential peace outcomes. First, the water governance and use agreements that are required to establish community-based irrigation systems can contribute to increased social cohesion through the definition of common goals, engagement in a common enterprise and facing shared challenges together. Second, irrigation systems can indirectly reduce resource-based conflict as they allow diversification into crops that can be commercialized, as well as production of staple crops such as corn and beans in the dry season when prices in the market are more favourable due to reduced supply. The additional income increases the ability to pay rent for land, thereby reducing tensions between landowners and farmers, and to capitalize rural credit unions, which have many positive economic and social benefits for the community, as discussed in TOC 1.

¹¹⁷ Vanni Frajese, G., 'Farmers' nature based solutions: Combining mitigation, adaptation, resilience, and biodiversity conservation in an affordable and inclusive, tested model', World Farmers' Organization, 22 Dec. 2020; Keesstra, S. et al., 'The superior effect of nature based solutions in land management for enhancing ecosystem services', *Science of the Total Environment*, 1 Jan. 2018, pp. 610–11: 997–1009; and Palmer, L., 'Finding peace', Nature Conservancy, 30 May 2020.

WFP's conflict sensitivity concerns related to conflicts between communities

As part of its FFA Resilience Programmes, WFP has supported its beneficiary communities to develop water-related infrastructure, such as dams, intake infrastructure at springs, pipes and irrigation.¹¹⁸ The infrastructure in some of these projects uses water from contested resources, such as a pipeline that takes water from a contested spring to a community. Building infrastructure to utilize a contested water source gives permanency to the water claim of those who benefit from the infrastructure. At the same time, however, building water infrastructure over a contested water resource may help balance the power between big landowners and small-scale farmers. However, a dispute over a water resource might be between two communities experiencing similar conditions of poverty and water stress. In each case, building water infrastructure that can increase or facilitate the use of a contested water resource can contribute to the escalation of a conflict.

As noted above, WFP's interventions that provide water infrastructure but concurrently benefit one particular group using a contested source can inadvertently support one side of a water conflict. Furthermore, such interventions risk intensifying conflict by legitimizing an unresolved water use claim through the construction of infrastructure. To reduce such risks, WFP should ensure that watershed-level analyses are carried out prior to any intervention as part of the programme design phase, to identify the main water users and potential users of the water resources available to beneficiary communities. These analyses should also include how women and men would be affected in the event of a water-related conflict. While the watershed is increasingly used as a planning unit for projects, the potential conflicts between different water users (both intended beneficiaries and non-beneficiaries) would need to be systematically included in project design to reduce the conflict sensitivity concerns raised. An additional step would be to facilitate water rights negotiations that explicitly include women in the negotiations between the different users, with the support of local and national institutions. As noted above, WFP has taken similar steps in many other communities.

Recommendations*Design phase*

7. Carry out gender-sensitive watershed level and conflict analyses to identify the main users and potential users of the water resources available to beneficiary communities. WFP has guidelines on conflict sensitivity risk assessments that could be adapted to local realities and used as part of the design of interventions.
8. Facilitate dialogues between the different water users, including nearby communities that could have a stake (e.g. upper and lower watershed communities), to discuss the impacts and benefits of potential WFP water-related interventions.
9. In the light of the increasing risk of water-related conflicts in the Dry Corridor, any irrigation interventions need to be accompanied by support for fair and gender-sensitive water governance, as well as thorough assessments of watershed-level users and potential conflicts.

¹¹⁸ Key informant interviews, WFP staff in Guatemala and Honduras; and WFP Guatemala, Pro Resilience INTPA international partnership report, Apr. 2020–Aug. 2021.

Implementation phase

10. Support communities to develop and improve water governance mechanisms that consider the impacts of climate variability and change, and reduce the risk of conflicts. Community-based water governance mechanisms should include: (a) water distribution/access schemes with rotating schedules for a fairer distribution of available water resources; (b) community-based water storage and harvesting for better sharing of drinking and irrigation water, particularly during periods of water deficits; (c) shared responsibilities beyond members of water boards for monitoring, maintenance and repair of water-related infrastructure, including training of at least one member per household (intended beneficiaries and non-beneficiaries); (d) setting rotating schedules for groups of community members to carry out the above monitoring, maintenance and repair tasks; (e) community contingency plans for periods of water deficit; (f) conflict prevention and management mechanisms at the community and watershed levels that include intended beneficiaries and non-beneficiaries. All these mechanisms should be developed with a gender-sensitive lens that considers the different roles and vulnerabilities of men and women, and that incentivizes the better integration of women into water-related decision making and water management.
11. Facilitate water rights negotiations and the establishment of micro-watershed management plans and watershed use rights agreements between different users with the support of local and national institutions. Watershed use rights agreements should consider the implications of changing social and environmental conditions and include user rights in the different scenarios of excess (e.g. in case of storms), sufficiency and scarcity. These should include contingency plans for periods of water deficit and have clear time frames and procedures for revision of the agreements based on changes in social and climatic conditions.
12. Include capacity building on negotiation skills and gender-sensitive conflict prevention and management mechanisms for intended beneficiaries as part of FFA Resilience Programmes. WFP could partner with peacebuilding organizations such as PROPAZ, which the Guatemala Country Office is already working with, to carry out these activities.
13. Continue to provide technical and financial support to identify soil and landscape nature-based solutions and for watershed restoration and protection activities, such as reforestation, the establishment of agricultural buffer zones, the definition of minimum ecological flow and watershed management plans, among other things.

Exit strategy and sustainability (plan beyond WFP's interventions)

14. Support communities to plan ahead. Some communities are buying land around springs or saving to buy land around springs—even springs they do not currently use—to reforest and help protect the watershed. This was being done even before WFP's arrival among the communities. WFP could help communities to identify and plan for alternative or complementary sources of surface and groundwater. While most communities may not have the purchasing capacity to buy land, they may be able to obtain

water use rights for nearby resources with the support of WFP and local institutions (even without purchasing the land). They may also be able to get involved in the declaration of micro-watersheds and the development of watershed management plans for relevant watersheds. Envisaging and preparing for conditions of increased water scarcity may also help to increase awareness of the importance of actively protecting and restoring water sources.

Concluding remarks

This report shows that WFP FFA programmes that seek to increase resilience in the Dry Corridor regions of Guatemala and Honduras can contribute to peace. The findings presented in this report show that, in addition to the aspects that improve the prospects for peace, there is room to strengthen the identification and mitigation of conflict sensitivity risks related to access to key natural resources, household and group dynamics, and tensions between intended beneficiaries and non-beneficiaries. These concerns are familiar from other WFP working contexts and are one of the reasons why WFP and SIPRI engaged in their knowledge partnership.

Although WFP's priority mandate is and will continue to be to eliminate hunger, through its interventions to save and change lives, some of its programmes are already contributing to maintaining peace. To address conflict sensitivity concerns, WFP could increase its efforts on conflict analysis and conflict sensitivity risk assessment, while also exploring the recommendations provided in this report. If implemented, these would help to make WFP's contribution to improving the prospects for peace in the Dry Corridor more systematic and consistent.

About the author

Sandra C. Valencia (Colombia) is a research consultant. Her main research focus and expertise is on climate change policy and practice in the Global South with particular focus on Latin America and the Caribbean. Other research experience and interests include urban sustainability, the localization of Agenda 2030 as well as the interlinkages between peace processes and the environment. She has experience in both academic and policy-oriented research and an interdisciplinary background in the natural and social sciences, with a PhD in Sustainability Science, a MSc. in Development Management and a B.S. in Physics.



**STOCKHOLM INTERNATIONAL
PEACE RESEARCH INSTITUTE**

Signalistgatan 9
SE-169 72 Solna, Sweden
Telephone: +46 8 655 97 00
Email: sipri@sipri.org
Internet: www.sipri.org