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## **Natural Disasters and Remittances**

Exploring the Linkages between Poverty, Gender,  
and Disaster Vulnerability in Caribbean SIDS

Marlene Attzs\*

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### **Abstract**

This paper explores the linkages between poverty and disaster vulnerability in the context of remittance flows to households in the Caribbean. Jamaica is used as the case study country. The paper discusses the channels through which natural disasters and remittances affect each other but also reviews the distribution of female-headed households in Jamaica as a percentage of households living below the poverty line and seeks to identify whether flows of remittances alleviate the post-disaster living conditions of such households.

The dislocation of households coupled with the loss of livelihoods caused by natural disaster, which usually affects the poor disproportionately, provides a push factor for

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Keywords: natural disasters, remittances, economics of gender, Jamaica

JEL classification: Q54, F24, J16

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\* Department of Economics, University of the West Indies, St. Augustine, emails: mattzs@fss.uwi.tt, mattzs@hotmail.com.

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migration and future remittances. After hurricane Gilbert in Jamaica (1988) there was an increase in migration. At the same time, there is an increased flow of remittances to help alleviate some of the suffering in the aftermath of a natural disaster.

The paper concludes that given the increase in remittances to Jamaica, this flow of income could be used to smooth out the consumption patterns of already vulnerable, female-headed households living in poverty.

### Acronyms

CAC	Central America and the Caribbean
CARICOM	Caribbean Community Secretariat
EM-DAT	Emergency events database
NPEP	National Poverty Eradication Programme Jamaica
PIOJ	Planning Institute of Jamaica
PVI	prevalent vulnerability index
SIDS	small island developing states
STATIN	Statistical Institute of Jamaica

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UNU World Institute for Development Economics Research (UNU-WIDER)  
Katajanokanlaituri 6 B, 00160 Helsinki, Finland

Typescript prepared by Liisa Roponen at UNU-WIDER

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## 1 Disaster, poverty and gender profile of the Caribbean

This paper has three objectives, namely to:

- i) highlight the vulnerability of Caribbean small island development states (SIDS) to natural hazards;
- ii) review the poverty profile of Caribbean SIDS. Additionally, the section looks at the levels of poverty in selected CARICOM<sup>1</sup> countries and highlights the fact that existing economic vulnerabilities (manifested as persons living in poverty) are exacerbated when hazards affect countries—the result is the passage of a natural disaster; and
- iii) provide an overview of a gendered approach to effective disaster risk-management.

### 1.1 Disaster profile of Caribbean countries

Caribbean countries are highly vulnerable to natural hazards.<sup>2</sup> What exacerbates the impact of these hazards and ultimately converts them into natural disasters<sup>3</sup> for this geographic region is the latent vulnerability of the area, in terms of its economic, social and environmental circumstances.

It is estimated that almost four million Caribbean citizens were affected by natural disasters<sup>4</sup> during the period 1990 to 2006. As Table 1 shows, the majority of those affected came from Haiti and Jamaica. It is also interesting to note that although Jamaica had fewer persons affected by disasters, it incurred the highest economic cost from disasters, totalling nearly US\$2 billion in disaster-related cost.

The region is particularly susceptible to windstorms and floods with 70 per cent of the persons affected by the former category of disaster and 27 per cent affected by the latter category. Earthquakes only affect 3 per cent of the total Caribbean population that suffered damage from disasters.

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<sup>1</sup> Member countries of CARICOM or the Caribbean community are Antigua and Barbuda, the Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, St Lucia, St Kitts and Nevis, St Vincent and the Grenadines, Suriname, Trinidad and Tobago.

<sup>2</sup> Hazards are defined here according to EM-DAT as a threatening event, or probability of occurrence of a potentially damaging phenomenon within a given time period and area.

<sup>3</sup> A disaster is defined as a 'situation or event, which overwhelms local capacity, necessitating a request to national or international level for external assistance: an unforeseen and often sudden event that causes great damage, destruction, and human suffering. Though often caused by nature, disasters can have human origins. Wars and civil disturbances that destroy homelands and displace people are included among the causes of disasters' (EM-DAT Glossary of Terms).

<sup>4</sup> In this document only the following disasters are covered: flood, earthquakes, and windstorms (hurricanes).

Table 1  
Socioeconomic impact of natural disasters on selected Caribbean countries, 1990-2006

Country	Total no. of disasters	Total no. of people affected	Total damage (US\$ '000)
Anguilla	1	150	50
Antigua and Barbuda	5	93,261	360,000
Bahamas	7	13,700	500,000
Barbados	3	3,000	0
Belize	7	145,170	330,240
Dominica	4	3,991	3,428
Grenada	4	62,045	894,500
Guyana	3	347,774	630,100
Haiti	28	2,221,815	101,000
Jamaica	13	943,734	1,808,787
St Kitts and Nevis	4	12,980	238,400
St Lucia	3	950	0
St Vincent and the Grenadines	5	1,834	0
Suriname	1	25,000	0
Trinidad and Tobago	7	1,787	25,127
<b>TOTAL</b>	<b>95</b>	<b>3,877,191</b>	<b>4,891,632</b>

Source: EM-DAT: The OFDA/CRED International Disaster Database.

## 1.2 Exploring the poverty/disaster nexus

The impact of disasters is not limited to the stark evidence on damage costs or lost lives but also reflects the possible impact on the developmental trajectory of a particular country. On this score, the literature on disasters and development has increasingly recognized that disasters are not simply extreme events created entirely by natural forces, but rather they are sometimes manifestations of unresolved problems of development.<sup>5</sup> There are also explicit linkages between disasters and other developmental challenges such as poverty. For example, poverty may lead to unsustainable livelihood practices that exacerbate inherent vulnerability with the result being disasters. To cite two examples:

- i) Hillside farming, slash and burn techniques which remove soil cover could cause mudslides and flooding following heavy rains;
- ii) Unsustainable forestry and deforestation to use trees for firewood and charcoal could have disastrous downstream effects, such as flooding, destruction of homes, infrastructure, etc.

Based on the poverty assessment studies done for selected CARICOM countries in the 1990s, at least six out of eleven countries had more than 30 per cent of their populations living below the poverty line (Table 2). This means that the inherent environmental vulnerability of these countries to natural disasters is exacerbated by the socioeconomic circumstances, especially, in this case, the level of pre-existing poverty.

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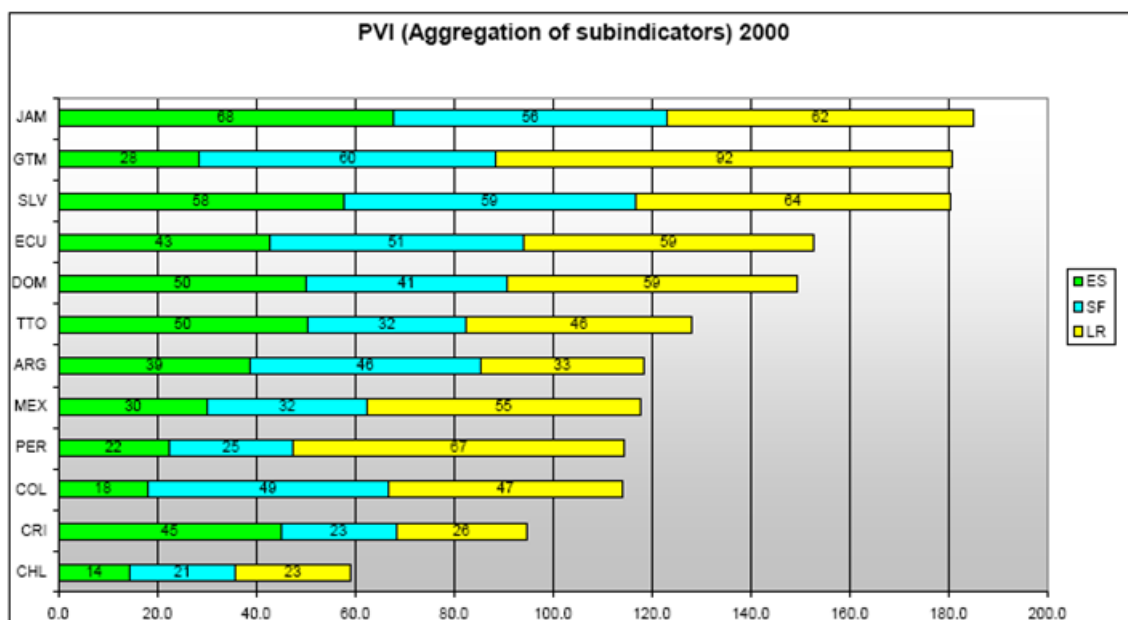
<sup>5</sup> Former UN Secretary General, Kofi Annan (2004) is reported as saying that ‘poverty and population pressure force growing numbers of poor people to live in harm’s way—on flood plains, in earthquake-prone zones and on unstable hillsides’.

Table 2  
Poverty profile of selected CARICOM countries

Country	Yr of poverty assessment	% population below the poverty line	% population below the indigence line
Barbados	1997	13.9	n.a.
Belize	1996	33.0	13.4
Grenada	1999	32.1	12.9
Guyana	1999	35.0	19.0
Jamaica	2001	16.8	n.a.
Nevis	2000	32.0	2.8
St Kitts	2000	30.5	2.5
St Lucia	1996	25.1	8.6
St Vincent	1996	37.5	12.6
Trinidad and Tobago	1992	21.2	n.a.

Source: Adapted from McDonald and Wint (2002).

Figure 1  
Prevalent vulnerability indicator: ranking of countries



Source: Cardona (2005).

Cardona (2003, 2005) identifies four indicators of disaster vulnerability focusing on economic, social, physical, and the actual performance of a country in engaging in effective disaster risk reduction measures. Cardona's prevalent vulnerability index (PVI) seeks to capture prevailing vulnerability based on: (i) exposure in prone areas (ES); (ii) socioeconomic fragility (SF), and (iii) lack of social resilience (LR) (see Figure 1).

All of the above can be captured in the disaster-poverty nexus since they all include elements that favour the direct and indirect impacts from hazards. In the context of this research it is also suggested that gender may be added as a cross-cutting indicator since it is documented in the literature that not only do the poor suffer the most in times of disasters but the poor also tend to be female. Table 3 details all of the sub-indicators used in the composite index.

Table 3  
Sub-indicators of exposure, resilience, and socio-economic fragility

Indicators of exposure/susceptibility	
–	Population growth, average annual rate (%)
–	Urban growth, average annual rate (%)
–	Population density, people/5 km <sup>2</sup>
–	Poverty-population below US\$1 per day PPP
–	Capital stock, million US\$/1,000 km <sup>2</sup>
–	Imports and exports of goods and services, % of GDP
–	Gross domestic fixed investment, % of GDP
–	Arable land and permanent crops, % of land area
Indicators of lack of resilience	
–	Human development index (HDI)
–	Gender-related development index (GDI)
–	Social expenditure: on pensions, health and education, % of GDP
–	Government index
–	Insurance of infrastructure and housing, % of GDP
–	Television sets per 1,000 people
–	Hospital beds per 1,000 people
–	Environmental sustainability index
Socioeconomic fragility	
–	Human poverty index, HPI-1
–	Dependents as proportion of working aged population
–	Social disparity, concentration of income measured using Gini index
–	Unemployment, as % of total labour force
–	Inflation, food prices, annual %
–	Dependency of GDP growth on agriculture, annual %
–	Debt servicing, % of GDP
–	Human-induced soil degradation (GLASOD)

Source: Cardona (2005).

Cardona's analysis of twelve countries in Latin America and the Caribbean<sup>6</sup> with respect to the PVI suggests that Jamaica is the most vulnerable country across all the contributing indicators: socioeconomic fragility, exposure in prone areas and lack of social resilience.

<sup>6</sup> Countries reviewed were Jamaica, Guatemala, El Salvador, Ecuador, Dominican Republic, Trinidad and Tobago, Argentina, Mexico, Peru, Colombia, Chile and Costa Rica (see also Figure 1).

Table 4  
Percentage of households headed by women, by size of household,  
for selected Caribbean countries, 1990/91

	All households, %	Size of household (no. of persons)			
		1	2-3	4-5	6+
St Kitts and Nevis	44	29	48	49	56
Barbados	43	41	45	39	52
Grenada	43	30	47	46	47
Antigua & Barbuda	41	33	46	42	47
St Lucia	40	33	45	42	39
Jamaica	40				
Montserrat	40	36	42	39	44
St Vincent & the Grenadines	39	22	44	43	45
Dominica	37	27	44	39	36
The Bahamas	35				
Guyana	28	35	33	25	27
Trinidad and Tobago	28	34	34	22	25
Belize	22	27	26	21	18

Source: CARICOM (2003).

A 1995 UNDP study suggests that 1.3 billion people worldwide live in poverty with 70 per cent of these persons being female. Data for selected Caribbean countries suggest that in some countries, Jamaica for example, at least 40 per cent of households are headed by females. Table 4 provides details. Given these data, therefore, it is not a far-fetched surmise that women tend to be very vulnerable to disasters.

The World Bank's (2000) *World Development Report* on attacking poverty suggests—in the online summary—that:

Vulnerability to external and largely uncontrollable events—illness, violence, economic shocks, bad weather, natural disasters—reinforces poor people's sense of ill-being, exacerbates their material poverty, and weakens their bargaining position. That is why enhancing security—by reducing the risk of such events as wars, disease, economic crises, and natural disasters—is key to reducing poverty. And so is reducing poor people's vulnerability to risks and putting in place mechanisms to help them cope with adverse shocks.

Wisner (2003) suggests that there is general agreement that risk is a part of the daily life of the poor and that comprehensive development (meaning some combination of human and economic development) should provide the conditions for increasing personal and social protection (UNRISD 2000).

### 1.3 Profile of Jamaica's female headed households

There has been a debate in Jamaica on the increasing feminization of poverty based on the increasing number of female-headed households that live in poverty.

Data from the Jamaica survey of living conditions (1999) seem to suggest that the gender dimension of poverty is not as significant for that country as it may be in other regions. In 1999 for example, of the total number of individuals living below the

poverty line, 50.7 per cent were males and 49.3 per cent females—an almost 50:50 distribution among men and women heading poor households.<sup>7</sup>

Louat, Grosh, and Van der Gaag (1993) concur with the view that there is a weak link between poverty and female headship. Notwithstanding this seemingly even distribution, females and female-headed households are usually more disadvantaged compared to their male counterparts in terms of limited access to resources and the ability to ensure a decent standard of living. What is more worrisome than the 50:50 distribution is the policy implication that, as the authors note (1993: 6):

with female headship affecting nearly half of society, any disadvantage suffered by such households will have repercussions for the welfare of society as a whole, not just for a small, fringe group. Hence, the study of female headship is important

Louat, Grosh, and Van der Gaag (1993) further identify some of the defining characteristics of female-headed households in Jamaica as follows:

- Overall, 42 per cent of households in Jamaica are headed by women. Of these, three-quarters (or 31 per cent of all households) are headed by women who are the oldest generation present in the household and who do not have a spouse or partner in the household. These conform to the most common perception of female headship.
- In nearly all of the other quarter of female-headed households, the woman who heads the household belongs to the oldest generation in the household but does have a spouse or partner present.
- In only 3 per cent of all households are there members of a generation older than that of the head. Even within that group, the portion of female household heads with and without spouses/partners is similar.
- 25 per cent of female heads of household have a partner present in the household (in contrast, 59 per cent of male heads of household have partners present).

#### **1.4 A gendered approach to disaster risk-management**

In the disaster risk-management literature, it is widely accepted that there are six stages in the disaster risk-management lifecycle covering the pre- and post-disaster phases. Fothergill (1998) suggests a gendered approach to disaster risk-management with the justification that men and women are likely to have different perceptions of the different disaster phases and an understanding of their different responses to these phases could enhance the efficiency of disaster risk-management. Table 5 is an adaptation of Fothergill's gendered risk-management stages.

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<sup>7</sup> It is interesting to note that the 1998 survey of living conditions for Jamaica suggests that 66.1 per cent of single parent households living in poverty were headed by females, while only 33.9 per cent were headed by males.



Table 5  
Gender roles in disaster risk-management

Stage of disaster risk-management	Active participant
Risk perception	WOMEN: perceive natural and man-made disasters as more serious than men.
Disaster preparedness	Both WOMEN and MEN: mixed levels of preparedness. Men pay more attention to technical aspects while women are more likely to ensure the family members are alright.
Disaster risk warning and response	WOMEN: given their societal roles and networks.
Emergency response	MEN: reconstruction and recovery.
Post-disaster recovery	WOMEN: most likely to receive help from family members (Drabek et al, 1975); to get emergency payments and seek public assistance for the family (Morrow and Enarson 1996).
Reconstruction	WOMEN AND MEN in different ways. Women, especially low-income women manage fairly poorly in the reconstruction phase given the fact that they have less insurance, less savings and less likelihood of long term recovery (Bolin and Bolton 1986). Khondker (1996) suggests that women in the developing world are more adversely affected in the long run, post-disaster.

Source: Adapted from Enarson and Morrow (1998).

In summary, Fothergill suggests that women are more likely to be the active risk respondent in the risk identification, risk warning (part of the risk mitigation phase), post-disaster, and reconstruction phases. These tendencies arise, in part, out of the traditional roles of women as caregivers and also because of the social networks that women are more likely to be part of than men.

## 2 Remittances and natural disasters

### 2.1 The significance of remittances to Caribbean economies: the case of Jamaica

Attz and Samuel (2007: 8) suggest some stylized facts about the relationship between disasters and remittances in Central America and the Caribbean as follows:

- Migration increases in the aftermath of natural disasters. The passage of hurricane Gilbert (1989) in Jamaica and hurricane Mitch (1998) in Central America set of periods of higher migration.<sup>8</sup> A similar situation occurred after the 2000 earthquake in El Salvador. Many people seek temporary refuge after these events and never return to their home country.
- There is potential reverse causation between migration and the severity of the effects of natural disasters. Migration from a given area reduces economic opportunities in the area, and needed infrastructure to mitigate the effects of natural disasters, like better drainage and flood controls, is postponed which

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<sup>8</sup> The United States extended the temporary protective status programme to migrants from Central America who left after the region was struck by hurricane Mitch.

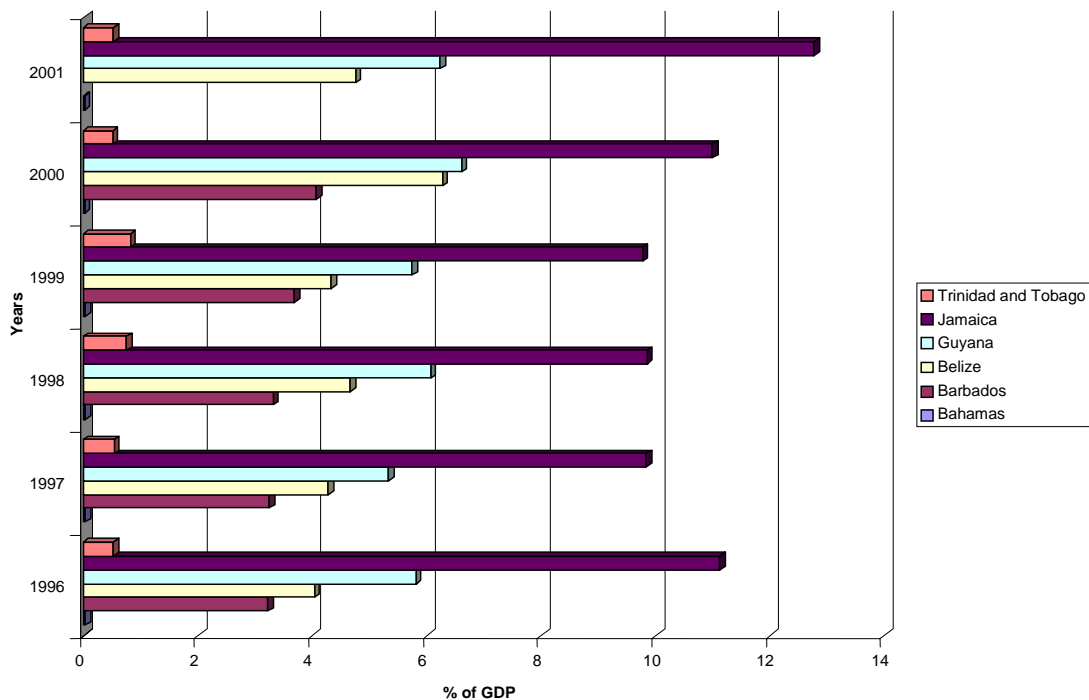
exacerbates the effects of the next event. The occurrence of the next natural disaster prompts even more migration.

- Remittances flows to the Central America and the Caribbean (CAC) countries have been commensurately significant with the levels of migration. Remittances to Jamaica now account for approximately 19 per cent of GDP.

Remittances are transfers from earnings or stock of wealth by individual migrants to their country of origin. The reasons for remittances include support of dependents, repayment of loans, investment or other purposes.

Of the English-speaking Caribbean countries, Jamaica has been the largest recipient of transfers, with remittances to that country increasing from US\$184 million in 1990 to US\$1,466 million in 2004, growth of 697 per cent over the 15 year period or 46 per cent per annum. The main sources of remittances to Jamaica are the US (60 per cent), the UK (25 per cent); Canada and the Cayman Islands (5 per cent each).

Figure 3  
Remittances as a per cent of GDP in selected CARICOM countries, 1996-2001



Source: Adapted from Kirton (2005).

Wisner (2003: 5) suggests that:

remittances to rural and poor urban households from abroad are acknowledged to have become more and more a part of livelihood systems... In the area of disaster risk reduction the transfer of funds from individuals abroad to assist recovery has been a notable feature of recent events such as the earthquakes in Gujarat and El Salvador.

A similar conclusion is drawn by Morduch (1994) who notes that remittances may play a significant role in smoothing consumption. Poor households that lack access to

insurance and credit markets are vulnerable to severe declines in income from adverse shocks, and they may be forced to forgo income-generating—but risky—strategies.

It is well documented that remittances also have had a special role in smoothing household consumption in the aftermath of disasters. As noted earlier, Jamaicans in the diaphora responded positively to the damage suffered in Jamaica after hurricane Gilbert. Specifically, as Clarke and Wallsten (2003: 5) record ‘remittances increase when the household is hit by an exogenous shock ... and each additional dollar of hurricane damage led to an increase of US\$0.25 in additional remittances’.

In the case of the Philippines, Yang and Choi (2005) estimate that for a sample of Filipino households, remittances replaced 60 per cent of income lost due to weather-related shocks. The literature also identifies a distributive lagged effect of remittances. Yang 2006 suggests that an analysis of cross-country data showed that US\$1 worth of hurricane damage led to roughly US\$0.13 in additional remittances in the year of the hurricane and US\$0.28 over five years after the damage.

Kirton’s (2005) commentary on the impact of remittances to Jamaica as supplemental income to poor households, suggests that 26 per cent of total annual expenditure of the poorest decile is funded by remittances, representing 87 per cent of total support received by this group. This group is by far the most heavily reliant on remittances for economic support, followed by the second poorest decile (see Table 6). Downes and Le Franc (2001: 11) highlight a ‘significant relationship between remittance flows and changing consumption-poverty levels [in Jamaica]’.

Table 6  
Importance of remittances by decile, Jamaica

Decile	Remittances as % of total annual expenditure	Total support* as % of total annual expenditure	Remittances as % of total support
1	26	30	87
2	17	31	55
3	11	21	52
4	12	21	57
5	14	16	88
6	15	19	79
7	11	13	85
8	14	20	70
9	16	20	80
10	7	14	50

Note: \* Total support includes support from children, relatives, remittances, rental income, national insurance schemes, pensions, food stamps, interest income, dividend income, and windfall.

Source: Author’s calculations based on data in PIOJ and STATIN (2002).

### 3 Policy implications and conclusions

This section distils some policy responses from the discussion above.

- The literature suggests that remittances are significant form of post-disaster financing which help to smooth consumption for affected households. The impact of remittances in this regard is seen as having both an immediate as well as a lagged effect. Many studies including Fajnzylber and López (2007) show that remittances rise in the year following an economic shock. In the case of the

Central America and the Caribbean, the major disasters are hurricanes and tropical storms that occur mainly during the third-quarter of the year. Hence one would expect an increase in remittances flows during the year of the disaster with some spillover into the following year for reconstruction purposes.

- The poor suffer the most especially in times of a disaster. With women constituting 70 per cent of the world's estimated 1.3 billion poor, there is need to have a gendered approach to disaster risk-management. The PVI clearly points to Jamaica's lack of socioeconomic and environmental resilience to disasters and, given both that country's poverty and gender profile, it is suggested that risk reduction policies are implemented bearing the gender disparities in mind.
- A useful disaggregation of the remittances data would be information on the recipients of remittances by gender and by structure of household. There is no doubt that remittances play a significant role in smoothing consumption after a disaster. The data for Jamaica contained in Table 6 show that for the poorest decile in that country, remittances constituted the lion's share of their income, 87 per cent. Additional useful information would be about who these recipients are, whether the split in remittances is 50:50 between male- and female-headed households, or whether women receive more than men. Casual empiricism suggests that women receive the greater portion of these remittances.

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