



Contents lists available at ScienceDirect

World Development

journal homepage: www.elsevier.com/locate/worlddev

Stakeholder perspectives on cocoa's living income differential and sustainability trade-offs in Ghana

Marshall Alhassan Adams^{a,b,c}, Sophia Carodenuto^{b,*}

^a University of Victoria, Center for Global Studies, Canada

^b University of Victoria, Department of Geography, David Turpin Bldg, 99111 Ring Rd., Victoria, BC V8P 5C2, Canada

^c Forestry Research Institute of Ghana, Ghana



ARTICLE INFO

Article history:

Accepted 21 January 2023

Keywords:

Governance
Cocoa
Commodity price
Ghana
Smallholder farmer
Agroforestry
Climate

ABSTRACT

Policy responses to balance the trade-offs between nature conservation and socioeconomic development have recently come to the fore in Ghana – the world's second largest producer of cocoa. In 2019, the Government of Ghana introduced the Living Income Differential (LID), which requires buyers to pay an additional US\$400 per ton of cocoa on top of the floor price. With low farmer incomes identified as a critical driver of multiple sustainability issues in Ghana's cocoa sector, this differential is meant to be directly transferred to cocoa farmers in response to the persistent challenge of poverty in cocoa farming communities. Using the Q methodology, we engaged over 50 stakeholders from various levels (international policy experts, cocoa sector stakeholders in Ghana, and cocoa farmers) to understand how the LID is perceived, including its potential to transform the rural poverty complex embedded in Ghana's cocoa supply chain. While the LID is lauded for increasing producer price across the board, our findings indicate that the lack of regard for farmer diversity (i.e., tenure rights, sharecroppers, and caretakers), farm size, and land management strategies (agroforestry versus clearing forest to establish farms) risks undermining the ability of this pricing mechanism to reduce farmer poverty. Further, the LID is siloed from on-going sustainability governance efforts in the sector, such as zero deforestation cocoa. If the LID is delivered to farmers across the board without any quid pro quo for how cocoa is produced, the policy's unintended consequences may include increasing deforestation in the short term, while lowering the world market price of cocoa in the long term as cocoa supply increases. We conclude with policy implications on why different perspectives matter in managing sustainability trade-offs in deforestation frontiers.

Crown Copyright © 2023 Published by Elsevier Ltd. All rights reserved.

1. Introduction

Despite widespread attempts to 'eat local,' many of the lifestyle factors in the Global North rely on the production of agrifood commodities that can only be grown in tropical ecosystems, far from the dominant geographies of consumption (Liu et al., 2019). Chocolate, coffee, and palm oil represent a handful of consumer goods that are described as 'tropical forest risk commodities,' whose production threatens some of the last remaining biodiversity hotspots and stable carbon sinks (Boysen et al., 2017; Cammelli et al., 2022). After Côte d'Ivoire, Ghana is the second largest exporter of cocoa (the main ingredient in chocolate). Ghana's economy has been described as "highly cocoa-dependent, as exemplified in the export share of cocoa products in total merchandise exports, estimated at

21 % in 2017" (Tröster et al., 2019, p. 15, citing UN Comtrade 2019). In Ghana, cocoa provides livelihoods for about a quarter of the population, especially in rural areas where alternative incomes are limited (Kroeger et al., 2017). Although the cocoa sector contributed an estimated US\$2.71 billion in government revenues in 2017 (Abadi et al., 2019), many cocoa producers live below the national poverty line (Vigneri & Kolavalli, 2018). Scholars explain that poverty persists in cocoa farming areas largely due to the unequal power structures in the commodity chain, where smallholders have the least price-setting power, while also being exposed to global price volatility (Tröster et al., 2019).

Although poverty is a multi-faceted and highly idiosyncratic phenomenon, scholars have long argued that the low price of cocoa beans is keeping farmers in poverty (Alence, 1990; Boysen et al., 2021; Oomes et al., 2016). Low price severely undermines the potential income gains from supply chain programs and creates barriers for farmers to invest in productivity and product quality

* Corresponding author.

E-mail address: carodenuto@uvic.ca (S. Carodenuto).

improvements (Aidenvironment & Sustainable Food Lab, 2018; Waarts et al., 2021). In response to these concerns about the farmgate price of cocoa (i.e., the producer's income), the government of Ghana – jointly with Côte d'Ivoire – introduced the Living Income Differential (LID) in 2019. The Ghanaian government explained that the LID is core to the wider efforts to improve the sustainability of the sector, with the Ghana Cocoa Board (COCOBOD) requesting: “the price of cocoa be considered as the determining factor of sustainability” (COCOBOD, 2022). This differential comes at a time when civil society and other stakeholders, such as the Living Income Community of Practice, are calling to improve living incomes that will enable smallholder farmers to achieve a decent standard of living and sustainable production (Fountain & Huetz-Adams, 2015; ICCO, 2012; ISEAL, 2022; van Vliet et al., 2021).

While it remains too early to assess policy effectiveness, many policy pundits have cautioned that LID is unlikely to achieve its stated aim of reducing smallholder poverty in the long term due to the difficulty of controlling increases in cocoa supply, which would push global prices down if not met with increases in demand. Further, achieving cocoa-related poverty reduction is hampered by the difficulty of aligning policy actions (e.g., provisions of extension services, infrastructure investments, land tenure and rights, local governance and social relations) between different actors (Boeckx et al., 2020; Ruben, 2021; Stanbury & Webb, 2021; Waarts et al., 2019, 2021). Such complementary actions are required because a living income alone does not necessarily shape poverty reduction (Boeckx et al., 2020; Morel et al., 2019). Other experts have suggested that the effectiveness of the LID will be significantly hampered by the current governance of the cocoa sector in Ghana, specifically the lack of transparency in how costs are distributed to various actors in the supply chain, and corrupt practices in terms of under-weighting cocoa beans of smallholder farmers (Brack, 2021; Ruben, 2021; Morel et al., 2019). Further, Ghana currently lacks a core LID policy document or official strategy, which results in different and conflicting views regarding how long-term poverty reduction should be achieved (Stanbury & Webb, 2021).

We employ the Q methodology to better understand cocoa sector stakeholders' perspectives on living income and sustainability trade-offs in Ghana. Q methodology is well suited for investigating highly debated and contentious policy issues (Barry & Proops, 1999; Langston et al., 2019; Nijnik et al., 2018; Nordhagen et al., 2021). The method has demonstrated significant potential for uncovering the underlying narratives of development, sustainability, natural resources management, and governance issues, wherein power and politics drive strategic policy actions (Adams et al., 2021; Barry & Proops, 1999; Cuppen et al., 2010, 2016; Kanbur & Shaffer, 2007; Langston et al., 2019; Nijnik et al., 2014; Shaffer, 2013). We add value to the current deliberations surrounding LID objectives and implementation by documenting areas of consensus and divergent viewpoints. Although other researchers have used Q methodology for policy analysis in natural resources management (Nordhagen et al., 2021; Phelps et al., 2021), this is – to the best of our knowledge – its first application to policies addressing living incomes in smallholder agriculture in the forest frontier. The forest frontier concept refers to the phenomenon that, around the world, “forests are subject to a huge variety of often competing socio-economic demands and environmental change” (Winkel et al., 2021, p. 2129). Beyond responding to the immediate need for understanding the perceived objectives and potential of the LID policy, our study may generate broader policy insights on understudied governance issues inherent to the LID mechanism, such as the role of supply chain transparency in a sector where the government (COCOBOD) controls prices and commodity marketing (Abbey et al., 2016; Asche, 2018).

The remainder of the paper is structured as follows. In Section 2, we introduce the LID mechanism. In Section 3, we explain how we

apply the Sustainable Livelihood framework to understanding living incomes in a holistic manner. In Section 4, we explain methodology, and in Section 5, we present the results, highlighting identified areas of consensus and disagreement. In Section 6, we discuss the opportunities and challenges for LID implementation in the specific context of Ghana. Section 7 allows us to derive policy implications and overall conclusions.

2. Filling the living income gap for cocoa farmers: the case of Ghana

A ‘living income’ is defined as the “net annual income required for a household in a particular place to afford a decent standard of living for all members of that household” (Living Income Community of Practice, 2020). The concept implies that cocoa farming households should not just earn enough to cover their basic subsistence and survival (i.e., poverty alleviation), but should be able to afford a decent standard of living, and to participate in social and cultural life (Smith & Sarpong, 2018). This includes the obvious necessities of food, water, housing, education, healthcare, transport, and clothing, but also a buffer for unexpected events such as medical emergencies.

The LID is a strategic pricing mechanism that aims to raise the farmgate price for cocoa farmers in the two biggest cocoa producing countries. Producing more than two-thirds of cocoa globally, Ghana and Côte d'Ivoire joined forces in an OPEC-like manner to introduce the LID, which requires any buyer on the international cocoa market to pay an additional US\$400 per ton on the export price from the 2020/21 crop, and onwards. This \$400/ton differential is intended to be passed on directly to cocoa farmers (Boysen et al., 2021). Both countries have strongly regulated sectors governed by COCOBOD in Ghana and the Conseil du Café-Cacao (CCC) in Côte d'Ivoire. These institutions regulate domestic price-setting, quality, cocoa trading, and tax revenue, and thus have an important impact upon the welfare of smallholders (Abbey et al., 2016). In Ghana, prices for farmers are set by the Producer Price Review Committee (PPRC). The PPRC sets the prices at the start of the season through its subsidiary, the Cocoa Marketing Company (CMC), which exports, sells forward, or hedges about 70 percent of the expected harvest. The PPRC is chaired by the Minister for Food and Agriculture, and the committee includes stakeholder representatives from farmers, transporters, Licensed Buying Companies (LBCs), the Minister for Finance and Economic Planning, and COCOBOD. Although the PPRC includes cocoa producer representatives, existing evaluations of the PPRC suggest farmers have minimum influence on decisions concerning price, and the process is mainly driven by political elites (Asche, 2018; Chinsinga & Naess, 2022). The farmgate price for cocoa farmers is a derivative of the expected export price, which is set at 70 percent of the charges for placing cocoa onboard a ship at the port of departure specified by the buyer in Ghana. All cocoa is bought through semi-privatized LBCs, which are permitted to offer higher prices through sustainability premiums as they compete for market share. However, the LID is independent from these sustainability premiums, as well as the ‘origin differential,’ whereby exporting countries demand higher prices based on national quality standards (Boakye, 2021; Boysen et al., 2021). Despite these efforts to not only set and stabilize domestic price, but also influence global cocoa prices, exporting countries remain “global price takers” with limited price-making power at the global level (Tröster et al., 2019, p. 6).

3. Sustainable livelihood framework

The Sustainable Livelihood (SL) framework helps to contextualize how the farmgate price for cocoa is only one factor influencing

the livelihoods of smallholders in Ghana. A SL is defined as the capabilities, assets (including both material and social resources), and activities required for a stable and secure living for households and local communities (Biggs et al., 2015; Chambers & Conway, 1992; Conroy & Litvinoff, 1988). Conceptually, the SL framework is positioned as a means of interlinking social, economic, and environmental concerns (Brocklesby & Fisher, 2003) that enables both present and future generations to access the natural resource base (Waarts et al., 2019). The SL framework is focused on “whether livelihood activities maintain and enhance, or deplete and degrade, the natural resource base” (Biggs et al., 2015, p. 390). Livelihood activities may entail human activity that contributes to land degradation, deforestation, soil erosion, and declining productivity. Conversely, sustainable livelihood activities may also have positive impacts on land and forest conservation through climate-compatible activities such as reforestation and agroecology (Tompkins et al., 2013).

As an analytical tool, the SL framework is useful for understanding the factors that influence a farmer's ability to enhance their livelihood while addressing the environmental degradation that often exacerbates, and is further exacerbated by, poverty (FAO, 2002). It recognizes five distinct but interrelated components: (1) livelihood assets; (2) vulnerability context; (3) transforming structures and processes; (4) livelihood strategies; and (5) livelihood outcomes. First, the SL framework proposes that farmers draw upon five *assets* (Natural, Human, Social, Physical, and Financial) to realize their livelihoods (Biggs et al., 2015). Second, these assets are *vulnerable* to external factors, including unpredictable economic trends such as cocoa prices and production, policy, and competition (Morse et al., 2009; Sneddon, 2000) and environmental shocks, such as climate change, pest or disease outbreaks (Busquet et al., 2021; Teye & Nikoi, 2021; Walters, 2021) and market stresses (Morse et al., 2009). Third, *transforming structures* include land ownership structures, level of government and private sector actions, and *processes* such as laws, regulations and policies, culture, institutions that determine access to natural resources and provide incentives to improve resource management (UNDP, 2017). Finally, *livelihood strategies* are the manner in which livelihood preferences and choices are combined in different ways that ultimately determine cocoa farmers' *livelihood outcomes*.

Transforming structures and processes basically entail the governance context of the cocoa sector, including policy implementation, monitoring, and coordination between public and private to make collective decisions, set collective goals, and take actions to achieve those goals. Analysis of governance is particularly important, and scholars have emphasized the significance of linking livelihood and governance debates when applying the SL framework, especially in the context of long-term, large-scale environmental change affecting agrarian development in rural economies (Biggs et al., 2014, 2015; Horsley et al., 2015; Scoones, 2009). However, many SL approaches to development focus on outcomes rather than the structures and processes that are often more influential in transforming livelihoods. Therefore, in our application of the Q methodology, we make an explicit link between SL and governance, and highlight our understanding that governance is incorporated in transforming structures and processes. Table 1 shows how the SL framework was applied through the development of Q statements.

4. Q methodology

The merit of Q methodology lies in its “possibility for structured, assumption-free analysis of perspectives” (Cuppen et al., 2016, p. 6). It has been touted as a mixed methods tool to analyze complex and interrelated issues holistically, providing potential

explanations despite access to an incomplete set of observations (Langston et al., 2019). Q methodology has been increasingly applied in forest and environmental studies (Adams et al., 2021; Isyaku, 2021; Langston et al., 2019; Loučanová et al., 2020; Nhem & Lee, 2020; Nijnik et al., 2018; Raum et al., 2021). In this study, we apply Q methodology to analyze stakeholder perspectives on the LID policy in Ghana using four phases explained in this section below. Study methods were approved by the University of Victoria Human Research Ethics Board (Application #21-0200). This paper represents one output of a transdisciplinary research project with SEND-Ghana, whereby researchers and non-academic communities of practice collaboratively defined the research question, data collection, and results interpretation (Carodenuto et al., 2022).

4.1. Concourse definition and Q statement selection

The first (and arguably most important) step in the Q methodology is the development of a concourse of statements to represent the range of ideas, opinions, and attitudes on the LID specifically, while keeping in mind the broader issues that influence a sustainable livelihood – or living income – in the cocoa sector. The statements were both theoretically and empirically derived. First, we identified 65 potential statements from the relevant literature, policy documents, reports, news items, and policy briefs. Based on this review, we conducted eight in-depth expert interviews from July 2021 to September 2021 to help identify the most salient Q statements (see Appendix 1 for interview guideline). In tandem, we applied the SL framework in order to structure and categorize the concourse of statements (Chambers & Conway, 1992). Through an iterative process, including through joint reflection and follow up with the expert informants, 36 Q statements related to the LID were derived (see Table 1). We conducted two Q sorts as test rounds to ensure consistency in interpretation and reduce redundancies.

4.2. Identification and selection of Q participants

We employed ‘purposive sampling,’ a non-probability sampling technique, to invite the most salient and knowledgeable LID stakeholders (i.e., Q participants) to participate in a Q sort, shown in Table 2 (Nhem & Lee, 2020; Raum et al., 2021). In addition, we asked our expert interviewees to recommend individuals based in Ghana that reflect the knowledge, expertise, interest, and perspectives of the LID. Our sampling approach had the explicit intention of maximizing participant diversity to compare voices and perspectives that are not often studied simultaneously, especially regarding our targeted inclusion of smallholders. We combined this with snowball sampling by asking Q participants to identify individuals with similar or different perspectives on the LID. Our sampling strategy was motivated by quality over quantity, as the Q method can utilize small sample sizes while remaining statistically sound in terms of comparing one factor with another (Black et al., 2019; Brown, 1980, p. 192): “as few as 12 participants can generate statistically meaningful results, in terms of the range of implicit discourses uncovered” (Barry & Proops, 1999, p. 344).

4.3. Q sort

The Q sort took place between September 2021 and December 2021. The process of Q sort involved sorting and allocating 36 printed index cards containing the statements on a seven-point scale (i.e., from +3 to -3), allowing for Q participants to sort the statements based on how strongly they agree or disagree. The following instructions were explained to each Q participant. First, the researchers asked Q participants to sort the 36 statements, shown one at a time, into one of three categories: Most agreed; Neutral;

Table 1
Q statements on LID mechanism in Ghana.

ID	Cocoa living income policy opinions and ideas	Sustainable Livelihood Framework component
S01	LID creates opportunities for cocoa farmers to invest in more sustainable farming practices.	Financial assets
S02	LID enables certainty and security of tenure rights and access to land.	Natural assets
S03	LID incentivizes farmers to clear more forests or encroach on protected areas.	Transforming structures and processes
S04	LID lacks actionable procedures for farmers to produce cocoa in a sustainable way.	Livelihood strategies
S05	LID decreases the funds available for sustainability programs.	Transforming structures and processes
S06	There is increased attention to address cocoa-driven deforestation because of LID.	Transforming structures and processes
S07	LID increases living income for cocoa farmers.	Financial assets
S08	LID guarantees a minimum farmer price throughout each season.	Vulnerability context
S09	LID will increase total cocoa production, resulting in cocoa supply exceeding demand.	Vulnerability context
S10	LID reduces government revenues from cocoa in Ghana.	Transforming structures and processes; Physical assets
S11	LID pushes down the price of cocoa by delaying purchases.	Vulnerability context; Financial assets
S12	Chocolate processors face a hedge problem because they cannot pass on the LID costs to their customers.	Transforming structures and processes
S13	There is limited capacity to effectively monitor LID within government and LBCs.	Transforming structures and processes
S14	LID faces the challenge of cocoa production risks, price fluctuation, and global market dynamics.	Vulnerability context
S15	There is inadequate information given about how the LID and related stabilization fund will work.	Transforming structures and processes
S16	The governments of Ghana and Côte d'Ivoire worked together to raise the farmgate price for cocoa farmers.	Transforming structures and processes
S17	LID suffers from weak enforcement by COCOBOD.	Transforming structures and processes
S18	Current LID does not account for the diversity ¹ of cocoa farmers in Ghana.	Social and human assets
S19	Challenges inherent in the LID policymaking itself include inadequate avenues/ channels to actively participate in and influence the cocoa sector process.	Transforming structures and processes; Livelihood strategies
S20	LID results in deforestation leakages in unregulated geographies.	Transforming structures and processes
S21	There is evidence of cocoa companies shifting purchases from Ghana to non-LID countries, where cocoa is cheaper.	Vulnerability context
S22	There is limited monitoring of how the LID affects implementation of sustainability programs.	Transforming structures and processes
S23	LID lacks a clear path for implementation and accountability.	Livelihood strategies
S24	There is limited transparency (e.g., information disclosure) surrounding how price premiums are distributed.	Transforming structures and processes
S25	There is no explicit negotiated or agreed long-term goal for LID.	Transforming structures and processes
S26	LID-related payments to cocoa farmers are delayed.	Vulnerability context
S27	LID increases fairness and transparency of cocoa sector processes.	Social assets; Transforming structures and processes
S28	LID incentivizes cocoa farmers to participate in decision-making regarding cocoa production at the local level.	Transforming structures and processes
S29	LID strengthens relationships between cocoa farmers and traders (LBCs).	Social assets
S30	LID supports efforts to relieve cocoa farmers' family poverty.	Livelihood outcomes
S31	LID creates personal benefits for LBCs that distribute the premium to cocoa farmers.	Transforming structures and processes
S32	Poor farmers are benefiting the least because LID is paid per kilogram.	Social assets
S33	Farmers are unaware of the LID.	Human assets
S34	The LID process lacks grievance procedures.	Transforming structures and processes
S35	Farmers remain unable to influence the farmgate price despite LID	Transforming structures and processes
S36	LID provides chocolate manufacturers with benefits associated with an improved corporate image.	Transforming structures and processes

¹ In this study context, diversity refers to considerable variation among different types of cocoa farmers in terms of land users (e.g., cocoa farm owners, sharecroppers, and caretakers), farm size, degree of specialization, resource use intensity, and cocoa yield (Ruben, 2021). This is important because cocoa policies like LID need to consider the variations, demand, and opportunities among different types of cocoa farmers to achieve their intended objectives.

and Least Agreed. Second, Q participants were asked to rank each statement within these three categories based on how strongly they agree or disagree. After this, an upside-down quasi-normal distribution chart was displayed on the floor or table, and each Q participant was asked to sort the 36 index Q statements on the scale ranging from -3 to $+3$ onto the quasi-normal distribution chart (see Fig. 1 for template). Lastly, participants were asked to give reasons for their choices of answers and explain anything they thought was missing from the discourse of statements. The Q sort and interviews took place in Accra, Kumasi, and Koforidua, and lasted 40–60 min. Twenty-two interviews were audio-recorded with the consent of the Q participants. For all others, detailed notes were transcribed (Creswell & Creswell, 2018).

4.4. Q sort analysis and interpretation

Using the steps outlined by Zabala (2014) and Phelps et al. (2021), we analyzed all completed Q sorts using R computational software with the qsort package (Sousa & Daniel, 2018). The Q sort analysis produces a set of three factors, which represents a group of stakeholder perspectives that are highly correlated with each other and uncorrelated with others (Živojinović & Wolfslehner, 2015). The 3-factor solution was selected based on the standard

criteria established by Brown (1980), whereby the eigenvalue of an interpretable factor is equal to and greater than 1.00 and at least two Q sorts load significantly. By this 'standard criteria,' Brown (1980) meant that factors with an eigenvalue in excess of 1.00 is a "generally accepted means of safeguarding factor reliabilities," and factors below this minimum have no data-reductive purpose as they explain less of the overall variance (Watts & Stenner, 2005, p. 16). Also, at least two Q sort significant loadings exemplify a shared pattern that is characteristic of each factor, and this serves as an interpretable 'best-estimate' of the pattern (Watts & Stenner, 2005, p. 17). In effect, the Q sorts were interpreted based on normalized factor scores and z-scores¹ and on the salience and distinctiveness of the statements (Phelps et al., 2021). The most agreed ($+3$ and also $+2$) and least agreed Q statements (-3 and sometimes -2) were used to interpret the factors, combined with the qualitative data from the interviews. Each perspective was interpreted, summarized, discussed, and revisited through an iterative process of interpreting the Q sort interviews and drawing on the SL theoretical

¹ The z-scores indicate the relationship between statements and factors, that is, how Q participants ranked each statement overall among the 36 statements. Q statements with a z-score of greater than 1 represent agreements and lower than -1 represent disagreements.

Table 2
Stakeholder categories included in the sample.

Code	Category of Q participants	Number of Q participants
GOV	Government (national and local)	5
IO	International organizations	4
FMR	Cocoa farmers	6
CSO	Non-Governmental/Civil society organizations	5
PS	Private sector (cocoa buyer, traders, and processors)	5
M	Cocoa sector media	1
R	Researchers	6
	Total	32

framework. The findings of the Q study were shared with Q participants for joint reflection, feedback, and validation during a stakeholder ($n = 31$, 20 men and 11 women) engagement workshop in Accra in April 2022. This workshop was helpful in deriving policy implications from our results.

5. Results

5.1. Characterization and interpretation of factors

The Q sort analysis and interpretation revealed three dominant perspectives on the LID, extracted from three factors that formed the best representation of distinct viewpoints about cocoa living income and sustainability tradeoffs in Ghana. Of the 32 Q participants, 28 were associated with one of the three factors identified as most significant. Cumulatively, the 3-factor solution explained 53 % of the variance in the Q sort data and resulted in an eigenvalue of 5.7, 4.7, and 2.8, respectively (see Appendix 2B). The first factor explains 18 % of total variance, the second explains 15 %, and the third factor explains 9 % (see Appendix 2B). This accounted for 14 Q participants loading statistically significantly on factor 1, 10 on factor 2, and 4 on factor 3. This statistically significant loading (i.e., correlation coefficients) shows the extent to which each Q participant is associated with each of the three composite factors (see flagged items in Appendix 2A). Each factor held a relatively similar ranking representing one dominant perspective on the LID. The factor ranking of statements in Appendix 2B shows which specific statements within the 3-factor solution have the closest rating and views, and which ones are more distinctive. To better understand the dominant stakeholder perspectives, especially the contentious issues in which key stakeholders are known to have opposing views, we estimated the aggregated perspective within each group regarding the perceived characteristics of the LID mechanism in Ghana (see Fig. 1). In the following, we summarize each perspective.

5.2. Perspective 1: LID presents a shared interest in raising income and tackling cocoa poverty

This perspective is constituted of 14 Q participants (44 % of the total), representing 18 % of the total variance for this study. The strongest loading on this factor was provided by the private sector (0.7130), followed by IOs (0.6575), media (0.6277), smallholder farmers (0.6123), and government (0.6100). A factor loading of 0.6277, for example, means that the perspective of the Q participant from the media (i.e., the Q sort of M01) is highly correlated with Q participants associated with perspective 1 (see Appendix 2B). The results in Table 3 show that Q statement number S07 is in strong agreement with perspective 1 (i.e., S07 has a statement score of 3 in parentheses and a z-score of 2.36 outside the parentheses). The Q participants associating with this perspective

express a shared interest in taking action to tackle poverty in Ghana's cocoa sector. Consistent with the Cocoa and Forests Initiative (CFI²) commitment to promote sustainable agricultural production and increase farmer incomes, this perspective prioritizes the role of living income (S07; 3/2.36) to reduce poverty among smallholder cocoa farmers (S30; 3/2.12). Q participants with this perspective explain poverty to be the root cause of cocoa-driven deforestation in Ghana. Perspective 1 is also characterized by a strong view that a living income creates opportunities for cocoa farmers to invest in more sustainable farming practices (S01; 2/1.35), which is in line with the Q participants' belief that the LID has placed increased attention on the importance of addressing cocoa-driven deforestation (S06; 2/1.13). Although these LID benefits are clear, Perspective 1 Q participants disagree that the LID lacks a clear path for implementation and accountability (S23; -3/-1.13), including more transparency surrounding how LID is implemented (S24; -2/-1.12), and price differential enforcement by COCOBOD (S17; -2/-1.07) in order to be effective. At the same time, perspective 1 Q participants strongly disagree that LID reduces government revenues from cocoa in Ghana (S10; -3/-1.38). Table 3 shows the statements with the highest positive and negative scores for this perspective, including explanatory quotes from the interviews.

5.3. Perspective 2: LID will not result in major sustainability trade-offs, such as increase in deforestation in protected forests

Perspective 2 explains 15 % of the total variance and is shared among 10 Q participants (31 % of the total) from farmers (0.7099), IOs (0.6432), civil society (0.6138), government (0.4682), and researchers (0.4494). Overall, the Q participants associated with this perspective also welcomed the LID. What distinguished this perspective from the first is that the Q participants here strongly disagreed with any statements that refer to the potential adverse consequences of the LID in terms of sustainability. For example, Q participants strongly disagree that the LID may result in deforestation leakages in unregulated geographies (S20, -3/-1.78), or that LID incentivizes farmers to clear forests or encroach on protected areas (S3, -3/-1.94) (Table 4). Within the cocoa sector, Q participants associated with this viewpoint perceive the LID to provide an important prerequisite for sustainable cocoa production in Ghana (S16; 3/1.53). While Q participants sharing this perspective appreciate increased income for cocoa farmers, they believe that LID uptake is limited by information given about how the LID will work. Perspective 2 Q participants explain that cocoa farmers are unaware of the LID (S33; 2/0.92). It was interesting to note from follow-up Q sort interviews that sharecroppers/caretakers are particularly unaware of LID, and the distribution of LID is exclusively the decision of the farm owners. As one of the Q participants pointed out:

“LID does not enable land rights and security at all (...) the possibility of this even creating a kind of insecurity in the farming community might be higher because now who takes the LID. So, sharing this sort of is like bonus, who takes it? So, this is where the conflict comes in. Is it the landowner or the sharecropper/caretaker who has worked the land, then it becomes a problem because the landowner is the one who probably owns the passbook for the sales? So, then, next year, the caretaker putting in energy to ensure that the cocoa beans come and then why he should have put in all this energy and then you take that bonus” (Government official, transcript # 130622_004).

² The Cocoa and Forests Initiative is a commitment of cocoa-producing countries (Ghana and Côte d'Ivoire, including Colombia) with leading chocolate and cocoa companies to end deforestation and restore forest areas, through no further conversion of any forest land for cocoa production (see <https://www.worldcofoundations.org/initiative/cocoa-forests-initiative/>).

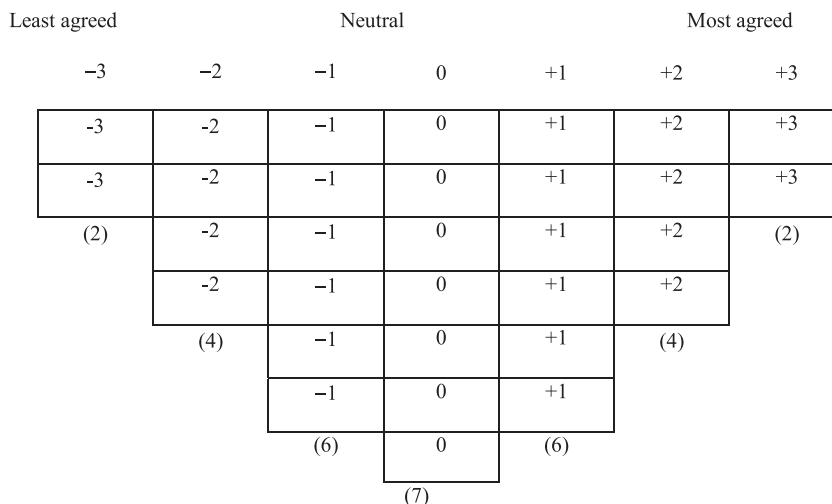


Fig. 1. Chart indicating the distribution of participant (dis-)agreement with Q statements.

Table 3

Q statements with the highest score for Perspective 1 and associated interview quotes.

ID	Relevant Q statements	Ranking	Description	Stakeholder with strongest loading
S07	LID increases living income for cocoa farmers.	(3)2.36	Agree	Private sector (i.e., LBC), IOs, media, farmers, and government representatives.
S30	LID supports efforts to relieve cocoa farmers' family poverty.	(3)2.12	Agree	
S23	LID lacks a clear path for implementation and accountability.	(-3)-1.13	Disagree	
S10	LID reduces government revenues from cocoa in Ghana.	(-3)-1.38	Disagree	

Relevant quotations

"(...) so, you see a direct impact of farmers getting an improvement in their incomes" (Government official, transcript #130617_001). "(...) the intention of LID [to increase living for cocoa farmers] is not achieved because it has been eroded by the country differential (...) even though all the buyers are paying LID [because of the fixed farm gate prices including LID], they [buyers] have resulted in undercutting the country differential" (Government official, transcript #130624_001). "...while I believe that the LID increases farmgate price, and therefore farmer incomes, it is by far not sufficient to reach a living income. So, it is important that the LID is not seen as the end or solution when it comes to farmer incomes in the cocoa sector, but it is just part of it" (IO representative, transcript 130615_010). "How much is the LID... the amount is so negligible to incentives cocoa farmers to clear forests or new areas for cocoa production...the labor cost is a big problem for cocoa farmers" (Media Representative, 14-10-2021).

Further, as the need for addressing low producer prices grows, farmers remain unable to influence the farmgate price despite the introduction of the LID (S35; 2/1.04).

5.4. Perspective 3: a successful cocoa living income draws upon good governance mechanisms

This perspective explains 9 % of the variance, and emphasizes that governance challenges inherent in the cocoa sector more broadly must be overcome to achieve the potential impacts of LID. Of the four Q participants (13 % of the total) associated with perspective 3, the highest loading came from researchers (0.728), private sector (0.725), and IOs (0.695). Compared to the previous two least critical perspectives of the LID (dominated by farmers and government officials), the Q participants associated with this perspective were less optimistic about the LID. For example, one industry representative stated: "the roadmap for the LID has been basically government centered" (#130701_001), indicating there is limited expectation for the LID to bring about transformation required to achieve a living income for farmers. Q participants explain the LID lacks grievance procedures (S34; 2/0.19), and the most climate-affected and vulnerable farmers in Ghana face the challenges inherent in LID policymaking, which include inadequate avenues/channels to actively participate in and influence the cocoa sector process (S19; 3/2.02) (Table 5). Furthermore, this perspec-

tive recognizes that the 'transforming structures and processes,' that is, governance, has not been reformed as required to truly achieve a living income. Follow-up Q sort interviews revealed that there has been limited coordination of the LID and other sustainability programs on the ground. As one of the most concerned perspectives on the LID, a Q participant revealed in follow-up Q sort interviews that: "(...) how the LID affects implementation of sustainability programs is one grey area probably we are not paying attention to" (Civil Society, transcript # 000101_001). Further, perspective 3 highlights that the LID may not incentivize cocoa farmers to participate in decision-making regarding cocoa production at the local level (S28; -3/-1.75). This is supported by the opinion that farmers remain unable to influence the farmgate price despite LID.

5.4.1. Areas of consensus and concurrence between perspectives

An important observation of the Q sort is that there are 11 consensus and 6 concurrence statements, which represents a significant amount of agreement across all three perspectives (see Appendix 2B). Consensus statements (***) are identified by comparing the z-scores of factor groups and statements shared by all three factors with a variance of "1," while concurrence statements (**) are those statements shared by all three factors and are between one and two factor rankings (see Fig. 2, with consensus shown in the lower half). Most areas of consensus relate to how

Table 4
Q statements with the highest score for Perspective 2 and associated interview quotes.

ID	Relevant Q statements	Ranking	Description	Stakeholder with strongest loading
S15	There is inadequate information given about how the LID will work.	(3)1.47	Agree	Farmers, IOs, civil society, government, and researchers.
S16	The governments of Ghana and Côte d'Ivoire worked together to raise the farmgate price for cocoa farmers.	(3)1.53	Agree	
S20	LID results in deforestation leakages in unregulated geographies.	(-3)-1.78	Disagree	
S03	LID incentivizes farmers to clear more forests or encroach on protected areas.	(-3)-1.94	Disagree	
Relevant quotations				
(..) LID is addressing price imbalance, price unfairness. So it has no direct link to sustainability." (Government representative, transcript #130624_001).				
"Because there are farmers who will tell you 'I have not even heard about this at all.' (...) when you go to their communities they don't even know what the LID is. (Government official, transcript #130622_004).				
"(...) they [the governments of Ghana and Côte d'Ivoire] are collaborating because they needed that united front because they contribute about 70–80 %" (Researcher, transcript # 130615_009)				

LID accounts for the diversity of cocoa farmers in Ghana (S18), but uncertainty exists around how it will impact the implementation of sustainability programs (S22) and global market prices for cocoa (S14). There was broad agreement that LID increases living income for cocoa farmers (S07). This is supported by the opinion that it guarantees a minimum price for cocoa farmers (S08) that could support efforts to relieve family poverty (S30). All three perspectives generally agree that LID requires effective monitoring (S22), information disclosure (S24), and grievance procedures (S34) to bridge the income gap of farmers and coordinate with other sustainability programs. Further, the results uncover a shared opinion that there is limited capacity to effectively monitor LID within government and LBCs (S13). For instance, participants appear to argue that LID-related payments to cocoa farmers are delayed (S26) and LID creates personal benefits for LBCs that distribute the premium to cocoa farmers (S31). Q participants also generally disagree that LID strengthens relationships between cocoa farmers and traders (S29). The results provide a neutral indication that current LID does not account for the diversity of cocoa farmers in Ghana (S18). Finally, all three perspectives maintain a relatively neutral view towards the concern that LID faces the challenge of inadequate economic data on cocoa production, risks, price fluctuation, and global market dynamics (S14), and LID lacks actionable procedures for farmers to produce cocoa in a sustainable way (S04).

5.4.2. Areas of disagreement

Nine statements exemplify areas of disagreement within the storylines embedded in the current discussions of the LID mechanism (see Fig. 2 and Appendix 2B). 'LID creates opportunities for cocoa farmers to invest in more sustainable farming practices' (S01) is the most controversial statement, where Q participants have the most opposing views. Specifically, perspectives 1 (S01; 2/1.35) and 2 (S01; 1/0.85) generally agree that LID creates opportunities for cocoa farmers to invest in more sustainable farming practices (S01), while perspective 3 (S01; -2/-1.29) disagrees with this statement. Further contention was revealed in the following statements: 'Challenges inherent in the LID policymaking itself include avenues/channels to actively participate in and influence cocoa sector process' (S19), and 'LID results in deforestation leakages in unregulated geographies' (S20). There were differences in perspectives regarding whether the 'LID pushes down the price of cocoa by delaying purchases' (S11); 'LID decreases the funds available for sustainability programs' (S05); and 'There is increased attention to address cocoa-driven deforestation because of LID' (S06). Related to governance concerns, perspectives 1 (S05; -1/-0.82) and 2 (S05; -2/-1.28) disagree that 'LID decreases the funds available for sustainability programs' (S05), whereas perspective 3 (0/0.18) maintains a neutral view toward the statement. One Q participant from the cocoa industry explained: "there is no guaran-

tee LID will affect implementing sustainability programs ... for example, the fact that we are going to be give LID to farmers has no correlate to where they are bringing their cocoa ... but we know that clearly some of the farmers are farming in forest reserves" (Cocoa industry, Transcript #130626_001).

The main areas of disagreement over governance relate to LID enforceability, where Q participants associated with perspective 1 (S17; -2/-1.07) disagreed that 'LID suffers from weak enforcement by COCOBOD' (S17). In contrast, perspective 2 (S17; 0/0.03) Q participants were ambivalent about this statement, while perspective 3 (S17; 1/0.80) Q participants least agreed with the claim. Interestingly, perspective 3 (S19; 3/2.02) strongly agrees that 'Challenges inherent in the LID policymaking include inadequate avenues/channels to actively participate in and influence cocoa sector process' (S19), while both perspectives 1 (S19; 0/-0.51) and 2 (S19; 0/0.58) display a neutral view about the instrumental nature of public participation to influence LID process.

Other issues that revealed contestation relate to the question of whether the 'LID incentivizes cocoa farmers to participate in decision-making regarding cocoa production at the local level' (S28). Perspective 1 perceives LID as providing an incentive for cocoa farmers to participate in farm productivity decisions, while perspectives 2 and 3 do not share this view. Perspective 1 also indicates that 'LID increases fairness and transparency of cocoa sector processes' (S27; 2/1.35), while perspectives 2 (S27; -1/-0.73) and 3 (S27; 0/0.14) put this statement among least agree and neutral viewpoints, respectively. Fourth, there is considerable difference in opinion regarding LID's impact on deforestation leakages. Whereas 'LID results in deforestation leakages in unregulated geographies' is considered as a strong agreement by perspective 3 (S20; 2/0.95), perspectives 1 (S20; -2/-1.12) and 2 (S20; -3/-1.78) strongly disagree that LID currently results in deforestation spillover – the situation where the LID may result in deforestation in other cocoa producing countries (such as Cameroon) if the cocoa industry procures based on price over environmental considerations. The last area of disagreement is related to 'LID pushes down the price of cocoa by delaying purchases,' where perspective 2 (S11; -2/-1.36) had markedly opposite views to perspective 3 (S11; 2/1.29), and perspective 1 demonstrated a neutral position (S11; 0/-0.54).

6. Discussion

We applied Q methodology to understand stakeholders' perspectives on the LID mechanism within the context of broader governance and sustainable livelihood factors in Ghana's cocoa sector. Our results suggest that at the start of LID implementation in the 2020/21 cocoa season, three stakeholder perspectives evolved to explain the potential of the LID to enable smallholders to obtain

Table 5
Q statements with the highest score for Perspective 3 and associated interview quotes.

ID	Relevant Q statements	Ranking	Description	Stakeholder with strongest loading
S07	LID increases living income for cocoa farmers.	(3)1.48	Agree	Researchers, private sector, and IOs.
S19	Challenges inherent in the LID policymaking itself include inadequate avenues/channels to actively participate in and influence cocoa sector process.	(3)2.02	Agree	
S10	LID reduces government revenues from cocoa in Ghana.	(-3)-1.90	Disagree	
S28	LID incentivizes cocoa farmers to participate in decision-making regarding cocoa production at the local level.	(-3)-1.75	Disagree	

Relevant quotations
 (...) there seems to be no clear institutional architecture of how the LID will be implemented over time... I know there's a price setting committee that involve farmers, but I'm not sure how strong their role is in that" (IO representative, transcript 130615_010; 9-11-2021).
 "(...) if you say challenges inherent in the LID policymaking itself include inadequate avenues/channels for farmers to practically participate in influencing the LID process...I strongly agree because the roadmap for the LID has been basically government centered" (Private sector, transcript #130701_001).
 And after all this happened, the price structuring is still the same (...) the status quo has not been designed to be participatory to that level (...) Farmers are not in there. They are represented by their representatives [leaders] (Researcher, transcript # 130615_009).

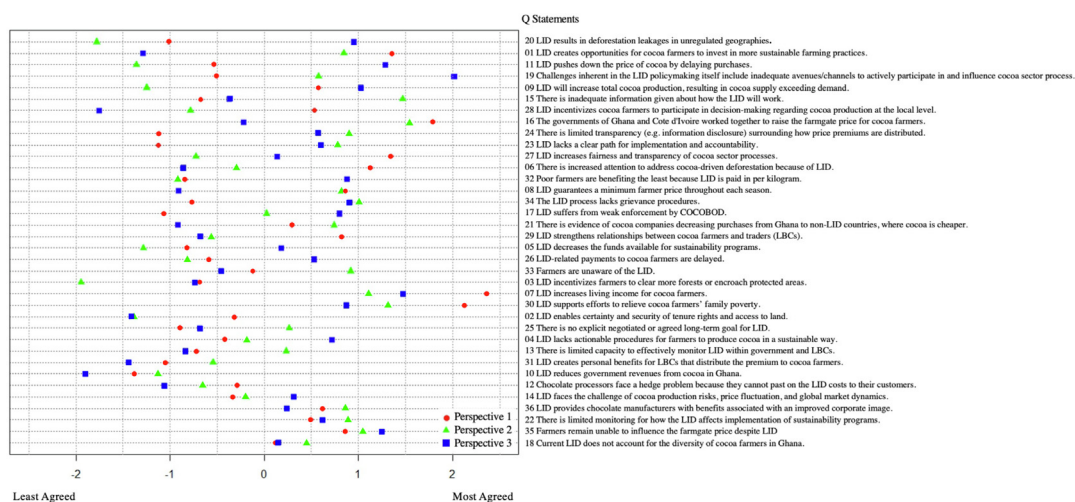


Fig. 2. Q Statements and their z-scores. Q Statements are arranged from the most contentious or divergent on top (most disagree in ranking among all factors) to the most consensus at the bottom. In the legend, each symbol represents the three dominant perspectives. Q statements with a z-score of greater than 1 represent agreements and lower than -1 represent disagreements.

a living income from cocoa production. Below we provide further context to elucidate these perspectives, including how they interact with other policies and institutional constraints to not only achieve a living income for smallholders, but a sustainable livelihood.

The perspectives we identified reveal a shared interest in raising income and tackling cocoa poverty, which shows the critical role of LID in improving cocoa farmers' income. This finding corroborates the conclusion drawn by Boakye (2021) that "a guaranteed minimum price can play a key role in combating the vicious cycle of poverty and social injustice by providing farmers with a living income" (p. 4). Our findings corroborate this belief, but our methods are limited to stakeholder perspectives only, and empirical analysis suggests that the relationship between agricultural income and poverty alleviation is not clear, and may differ significantly across social groups (Hirons et al., 2018). Further, the link between producer price for cocoa, and farm-level investments in sustainable intensification strategies such as agroforestry, is not well understood. In other words, how farmers will use the additional income generated through LID requires further investigation. However, it is clear from our interview data and stakeholder validation workshop that the current price differential and sustainability price premiums are not enough to bridge the living income gap, and even less so to enable a transition to sustainable cocoa production, including in other cocoa production

geographies (Boeckx et al., 2020; Fountain & Huetz-Adams, 2020; Waarts et al., 2021).

The LID follows a long list of historical efforts to address the well-documented living income gap (Waarts et al., 2021). For several decades, interventions to address poverty among smallholder cocoa farmers in Ghana include technical solutions such as farmer outreach for sustainability certification (such as Rainforest Alliance/UTZ), crop diversification programs, training on cocoa farming practices, and provision of farm inputs such as fertilizers, agrochemicals, cocoa seedlings, and equipment to farmers and their organizations (Ingram et al., 2018). These interventions have had limited, mixed, or no impacts on household income, social equalities, including child labor and deforestation (Fountain & Huetz-Adams, 2018; Skalidou, 2019; Waarts et al., 2019). Some explain this is because government-led efforts that promote smallholder productivity often remain limited in scope or "fail to pair those interventions with investments in securing smallholder and community rights, institutions, public services, and market access" (NYDF Assessment Partners, 2020, p. 9). One explanation is that the commodification and globalization of cocoa has led to over-exploitation of forests, and farmers are suffering from the long-term impacts associated with forest loss and degradation, including poor soil fertility, water retention, and local climate regulation (Ameyaw et al., 2018; Bymol et al., 2018; Ingram et al., 2018). Along these lines, the literature suggests that interventions to address the

nexus of poverty-sustainability challenges in smallholder commodity export contexts are associated with governance failures in developing and translating effective, efficient, and equitable policies into comprehensive actions that address the systemic and inter-related nature of poverty and cocoa-driven deforestation (Lambin et al., 2018; Ruben & Fort, 2012; Waarts et al., 2019). We see this reappear with the LID in that the LID is distributed to all farmers, regardless of whether they may have encroached on protected areas. With a large share of the global supply of cocoa coming from a limited geographical region (e.g., Côte d'Ivoire and Ghana), the commercial interests of chocolate traders and manufacturers might lead to a leakage of sourcing towards non-LID countries over time (Boysen et al., 2021). Scholars suggest that tropical forest-risk commodities such as cocoa could be governed more effectively to tackle these interrelated sustainability challenges if policy tools and governance arrangements have more integrated goals that take farm-level contextualities into account (Ingram et al., 2018; Mithöfer et al., 2017). The governance of the LID remains vague, and experts have suggested that the LID will not be able to fundamentally change the underlying drivers of poverty and deforestation, which include limited transparency surrounding how cocoa prices are distributed and how accountability is ensured (Oxford Analytica, 2020; Stanbury & Webb, 2021).

In addition, the history of institutional arrangements and colonial policies in Ghana's cocoa sector affect the distribution of powers among various interest groups (Teye & Nikoi, 2021), with decision power allocated disproportionately to better-off farmers in lead positions (Ruben, 2021). This situation may be aggravated because the LID mechanism fails to take into account that the vast majority of cocoa farmland in Ghana is under insecure customary land tenure, cultivated under sharecropping arrangement (Asaaga et al., 2020). This implies that cocoa policy like LID creates the possibility of tenure insecurity and exclusion among the vulnerable sharecroppers and other social groups, such as women and migrants (Asaaga et al., 2020). Differentiating land users to consider the demand and opportunity of different types of cocoa farmers, and linking them to the LID mechanism, may reduce the risk of socio-economic conflict and negative environmental impacts at scale (Ruben, 2021).

Our findings also indicate opposing stakeholder views about the criticism of cocoa price-setting efforts such as LID resulting in stimulation of production leading to over-supply (Brack, 2021; Oomes et al., 2016). For example, the high cocoa farmgate prices in 2015/2016 are thought to have stimulated the high production levels in 2017 (Aidenvironment & Sustainable Food Lab, 2018), but this likely requires a longer-term perspective, and attribution is difficult. While it is uncertain that futures market will significantly affect cocoa prices in highly regulated cocoa sectors like Côte d'Ivoire and Ghana, their country quality differentials (which is usually paid on top of the international market price) have been negatively impacted following implementation of the LID mechanism (Boysen et al., 2021).

Scholars have argued that price increases require supply chain management to offer a more sustainable and long-term income impact without negative impact on forests and biodiversity (Boysen et al., 2021; Waarts et al., 2019). Using a global multi-regional partial equilibrium model of the world cocoa market, Boysen et al. (2021) suggest that the LID may affect farmgate prices (and thus welfare) of cocoa farmers positively if supply control measures are effectively implemented. They concluded that the magnitude of the LID effects is thus linked to policy implementation details, and how these details interact with unpredictable market behavior (Boysen et al., 2021). Following the Q method justification that stakeholder dissonance and discontent can put policies, programs, and projects at risk (Cuppen et al., 2016), we find that LID governance faces unstructured and multiple perspectives

on the desirability and feasibility of important implementation details – such as supply control measures – that influence policy effectiveness and equity outcomes. Arguably, in order for cocoa sustainability policy to be effective in tackling low incomes in cocoa supply chains and addressing poverty and deforestation at scale, key stakeholders (e.g., cocoa buyers, farmers, and civil society) that play a role in addressing, monitoring, and demanding accountability surrounding these challenges must be engaged: “rather than become a discursive barrier, different perspectives [on LID implementation issues] can be made transparent, and if management coalitions account for them, they can enable more equitable delivery of benefits to a broad range of actors within a landscape” (Langston et al., 2019, p. 3).

Despite the fact that we combined the strengths of both qualitative and quantitative approaches to probe the explanatory power of LID implementation from stakeholder perspectives, it is important to indicate that about 47% of the three factors remained unexplained. Also, the majority of stakeholders interviewed offered a top-down perspective with only 6 of the 32 Q participants being cocoa farmers. This limitation may undercut some of the insights of our study. To fill this gap, we triangulated different data from the literature review, interviews with 8 global experts, 32 Q sort interviews, and a stakeholder engagement workshop in Ghana. Triangulating of these data sources helped explain the underlying perspectives, and provided a more nuanced understanding of LID. Along the same line, we caution against detailed comparison, extrapolation, or generalization of our findings on LID implementation to different cocoa production geographies and policy contexts.

7. Conclusion

This study contributes to the literature on cocoa living income by integrating the living income concept with the Sustainable Livelihoods Framework to broaden the understanding of poverty and access. Further, our application of the Q methodology allowed us to analyze a policy mechanism that is not only new, but also where information is limited. The Living Income Differential (LID) in Ghana aims to guarantee a fair and equitable approach to poverty alleviation that considers the heterogeneity of cocoa farmers, whereby all cocoa farmers, regardless of size or production practice, benefit from a farmgate price increase. Despite these laudable intentions, the introduction of this pricing mechanism may have uncertain and potentially negative impacts on sustainability objectives such as Ghana's zero deforestation cocoa agenda, which aims to scale up agroforestry and eliminate cocoa farming that encroaches on protected areas, or industry programs that incentivize sustainable intensification through third-party certification (such as Rainforest Alliance). Our findings reveal that the LID does not account for certain contextual nuances such as sharecropping arrangements and thus may not lift the most vulnerable segments of cocoa producers out of poverty. Finally, there is significant disagreement among sector stakeholders regarding whether the LID will create opportunities for cocoa farmers to invest in more sustainable farming practices. This calls for empirical research to better understand cocoa farmers' willingness to invest in sustainable production.

CRedit authorship contribution statement

Marshall Adams: Conceptualization, Data curation, Investigation, Methodology, Writing – original draft. **Sophia Carodenuto:** Conceptualization, Funding acquisition, Methodology, Project administration, Writing – review & editing, Supervision.

Data availability

The data that has been used is confidential.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

We would like to thank SEND-Ghana, especially Sandra Kwabea Sarkwah, Emmanuel Ayifah, and Siapha Kamara for jointly conceptualizing this research and for organizing and co-funding the stakeholder workshop.

Funding

This work was supported by the Social Sciences and Humanities Research Council of Canada (SSHRC) project 'Uncovering the Hidden Cocoa Trade in Ghana: Policy Advocacy to Improve Farmer Livelihoods' [grant number 430-2020-00763]; Rufford grant "Bio-diversity Conservation through Cocoa Agroforestry Systems: How to Support Smallholder Farmers Manage Integrated Landscape in Ghana," [grant number 35669-2] and the University of Victoria Centre for Global Studies (CFGS).

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.worlddev.2023.106201>.

References

- Abbad, S., Senadza, B., Lieu-Kie-Song, M., & Abebe, H. (2019). Assessing the employment effects of processing cocoa in Ghana (Strengthen). *International Labour Organization*. https://www.ilo.org/africa/countries-covered/ghana/strengthen/WCMS_673136/lang-en/index.htm.
- Abbey, P., Tomlinson, P. R., & Branston, J. R. (2016). Perceptions of governance and social capital in Ghana's cocoa industry. *Journal of Rural Studies*, 44, 153–163. <https://doi.org/10.1016/j.jrurstud.2016.01.015>.
- Adams, M. A., Kayira, J., Gruber, J. S., Idemudia, U., Tegegne, Y. T., Nantogmah Attah, A., ... Ansong, M. (2021). Good governance practices in Ghana's FLEGT voluntary partnership agreement process: An application of Q methodology. *Journal of Environmental Policy & Planning*, 23(1), 1–15. <https://doi.org/10.1080/1523908X.2020.1784116>.
- Aidenvironment, & Sustainable Food Lab. (2018). *Pricing mechanisms in the cocoa sector: Options to reduce price volatility and promote farmer value capture*. http://www.aidenvironment.org/wp-content/uploads/2018/03/Pricing-mechanisms-paper_final.pdf.
- Alence, R. (1990). The 1937–1938 Gold Coast Cocoa Crisis: The Political Economy of Commercial Stalemate. *African Economic History*, 19, 77–104. <https://doi.org/10.2307/3601893>.
- AmeYaw, L., Ettl, G., Leissle, K., & Anim-Kwapong, G. (2018). Cocoa and Climate Change: Insights from Smallholder Cocoa Producers in Ghana Regarding Challenges in Implementing Climate Change Mitigation Strategies. *Forests*, 9(12), 742. <https://doi.org/10.3390/f9120742>.
- Asaaga, F. A., Hirons, M. A., & Malhi, Y. (2020). Questioning the link between tenure security and sustainable land management in cocoa landscapes in Ghana. *World Development*, 130. <https://doi.org/10.1016/j.worlddev.2020.104913>.
- Asche, H. (2018). *Whose cocoa? Exposure-und Dialogprogramme Occasional paper*. Exposure and Dialogue Programme Association. https://edpev.de/fileadmin/user_upload/redaktion/Pdf/Asche_Helmut_WhoseCocoa.pdf.
- Barry, J., & Proops, J. (1999). Seeking sustainability discourses with Q methodology. *Ecological Economics*, 28(3), 337–345. [https://doi.org/10.1016/S0921-8009\(98\)00053-6](https://doi.org/10.1016/S0921-8009(98)00053-6).
- Biggs, E. M., Boruff, B., Bruce, E., Duncan, J. M. A., Haworth, B. J., Duce, S., ... Imanari, Y. (2014). Environmental livelihood security in Southeast Asia and Oceania: A water-energy-food-livelihoods nexus approach for spatially assessing change. White paper. *International Water Management Institute (IWMI)*. <https://doi.org/10.5337/2014.231>.
- Biggs, E. M., Bruce, E., Boruff, B., Duncan, J. M. A., Horsley, J., Pauli, N., ... Imanari, Y. (2015). Sustainable development and the water–energy–food nexus: A perspective on livelihoods. *Environmental Science & Policy*, 54, 389–397. <https://doi.org/10.1016/j.envsci.2015.08.002>.
- Black, J. E., Kopke, K., & O'Mahony, C. (2019). Towards a Circular Economy: Using Stakeholder Subjectivity to Identify Priorities, Consensus, and Conflict in the Irish EPS/XPS Market. *Sustainability*, 11(23), 6834. <https://doi.org/10.3390/su11236834>.
- Boakye, R. (2021). *Politics, power and unfair market concentration in the cocoa global value chain (GVC): Analysing the prospects of the living income differential (LID) for achieving a just and sustainable livelihood for cocoa farmers in Ghana*. [Masters Thesis, Saint Mary's University]. https://library2.smu.ca/bitstream/handle/01/29867/Richard_Boakye_MASTERS_2021.pdf?sequence=1&isAllowed=y.
- Boeckx, P., Bauters, M., & Dewettinck, K. (2020). Poverty and climate change challenges for sustainable intensification of cocoa systems. *Current Opinion in Environmental Sustainability*, 47, 106–111. <https://doi.org/10.1016/j.cosust.2020.10.012>.
- Boysen, L. R., Lucht, W., & Gerten, D. (2017). Trade-offs for food production, nature conservation and climate limit the terrestrial carbon dioxide removal potential. *Global Change Biology*, 23(10), 4303–4317. <https://doi.org/10.1111/gcb.13745>.
- Boysen, O., Ferrari, E., Nechifor, V., & Tillie, P. (2021). *Impacts of the cocoa living income differential policy in Ghana and Côte d'Ivoire*. No. JRC125754. <https://doi.org/10.2760/984346>.
- Brack, D. (2021). *Towards sustainable cocoa supply chains: Regulatory options for the EU*. Fern, Tropenbos International, and the Fair Trade Advocacy Office. <https://www.fern.org/fileadmin/uploads/fern/Documents/2019/Fern-sustainable-cocoa-supply-chains-report.pdf>.
- Brocklesby, M. A., & Fisher, E. (2003). Community development in sustainable livelihoods approaches—An introduction. *Community Development Journal*, 38(3), 185–198. <https://doi.org/10.1093/cdj/38.3.185>.
- Brown, S. R. (1980). *Political subjectivity: Applications of Q methodology in political science*. Yale University Press.
- Busquet, M., Bosma, N., & Hummels, H. (2021). A multidimensional perspective on child labor in the value chain: The case of the cocoa value chain in West Africa. *World Development*, 146. <https://doi.org/10.1016/j.worlddev.2021.105601>.
- Bymol, R., Laven, A., & Tyzler, M. (2018). *Demystifying the cocoa sector in Ghana and Côte d'Ivoire*. The Royal Tropical Institute (KIT). Amsterdam, The Netherlands. <https://www.kit.nl/wp-content/uploads/2020/05/Demystifying-complete-file.pdf>.
- Cammelli, F., Levy, S. A., Grabs, J., Valentim, J. F., & Garrett, R. D. (2022). Effectiveness–equity tradeoffs in enforcing exclusionary supply chain policies: Lessons from the Amazonian cattle sector. *Journal of Cleaner Production*, 332. <https://doi.org/10.1016/j.jclepro.2021.130031>.
- Carodenuto, S., Schwarz, B., Nelson, A., Bome, G., & Andre, G. (2022). Practice-Based Knowledge for REDD+ in Vanuatu. *Society & Natural Resources*, 35(2), 220–241. <https://doi.org/10.1080/08941920.2021.2011996>.
- Chambers, R., & Conway, G. (1992). *Sustainable rural livelihoods: Practical concepts for the 21st century*. Institute of Development Studies.
- Chinsinga, B., & Naess, L. O. (2022). *The Political Economy of Agricultural Commercialisation: Insights from Crop Value Chain Studies in Sub-Saharan Africa*. Institute of Development Studies (IDS). <https://doi.org/10.19088/APRA.2022.014>.
- COCOBOD. (2022). *Press Release – Cote D'Ivoire–Ghana Initiative*. COCOBOD. <https://cocobod.gh/news/press-release-cote-divoire-ghana-initiative>.
- Conroy, C., & Litvinoff, M. (Eds.). (1988). *The Greening of Aid: Sustainable livelihoods in practice (1st ed.)* (0 ed.). Routledge. <https://doi.org/10.4324/9781315067025>.
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches ((Fifth edition))*. SAGE.
- Cuppen, E., Bosch-Rekvelde, M. G. C., Pikaar, E., & Mehos, D. C. (2016). Stakeholder engagement in large-scale energy infrastructure projects: Revealing perspectives using Q methodology. *International Journal of Project Management*, 34(7), 1347–1359. <https://doi.org/10.1016/j.ijproman.2016.01.003>.
- Cuppen, E., Breukers, S., Hisschemöller, M., & Bergsma, E. (2010). Q methodology to select participants for a stakeholder dialogue on energy options from biomass in the Netherlands. *Ecological Economics*, 69(3), 579–591. <https://doi.org/10.1016/j.ecolecon.2009.09.005>.
- FAO. (2002). *Analytical Framework: Sustainable Livelihoods*. Food and Agriculture Organisation of the United Nations. <http://fao.org/docrep/007/j2602e02.html>.
- Fountain, A., & Huetz-Adams, F. (2015). *Cocoa Barometer 2015*. <https://voicenetwerk.cc/wp-content/uploads/2019/07/Cocoa-Barometer-2015-Print-Friendly-Version.pdf>.
- Fountain, A., & Huetz-Adams, F. (2018). *Cocoa Barometer 2018*. <https://voicenetwerk.cc/wp-content/uploads/2019/07/2018-Cocoa-Barometer.pdf>.
- Fountain, A., & Huetz-Adams, F. (2020). *Cocoa Barometer 2020*. https://www.voicenetwerk.eu/cocoa-barometer/?_ga=2.22212466.850917430.1607310573-933129709.1606892199.
- Hirons, M., Robinson, E., McDermott, C., Morel, A., Asare, R., Boyd, E., ... Norris, K. (2018). Understanding Poverty in Cash-crop Agro-forestry Systems: Evidence from Ghana and Ethiopia. *Ecological Economics*, 154, 31–41. <https://doi.org/10.1016/j.ecolecon.2018.07.021>.

- Horsley, J., Prout, S., Tonts, M., & Ali, S. H. (2015). Sustainable livelihoods and indicators for regional development in mining economies. *The Extractive Industries and Society*, 2(2), 368–380. <https://doi.org/10.1016/j.exis.2014.12.001>.
- ICCO. (2012). *Abidjan cocoa declaration*, *World Cocoa Conference 2012*. <https://www.icco.org/wp-content/uploads/2019/07/Abidjan-Cocoa-Declaration-23.11.12-FINAL-PDF-1.pdf>.
- Ingram, V., van den Berg, J., van Oorschot, M., Arets, E., & Judge, L. (2018). Governance Options to Enhance Ecosystem Services in Cocoa, Soy, Tropical Timber and Palm Oil Value Chains. *Environmental Management*, 62(1), 128–142. <https://doi.org/10.1007/s00267-018-0996-7>.
- Iseal (2022). *Global Living Wage Coalition*. ISEAL Alliance.
- Iyaku, U. (2021). What motivates communities to participate in forest conservation? A study of REDD+ pilot sites in Cross River, Nigeria. *Forest Policy and Economics*, 133. <https://doi.org/10.1016/j.forpol.2021.102598>.
- Kanbur, R., & Shaffer, P. (2007). Epistemology, Normative Theory and Poverty Analysis: Implications for Q-Squared in Practice. *World Development*, 35(2), 183–196. <https://doi.org/10.1016/j.worlddev.2005.10.016>.
- Kroeger, A., Bakhtary, H., Haupt, F., & Streck, C. (2017). *Eliminating Deforestation from the Cocoa Supply Chain*. Washington, DC: World Bank. <http://hdl.handle.net/10986/26549>.
- E.F. Lambin H.K. Gibbs R. Heilmayr K.M. Carlson L.C. Fleck R.D. Garrett le Polain de Waroux, Y., McDermott, C. L., McLaughlin, D., Newton, P., Nolte, C., Pacheco, P., Rausch, L. L., Streck, C., Thorlakson, T., & Walker, N. F. The role of supply-chain initiatives in reducing deforestation Nature Climate Change 8 2 2018 109 116 [10.1038/s41558-017-0061-1](https://doi.org/10.1038/s41558-017-0061-1).
- Langston, J. D., McIntyre, R., Falconer, K., Sunderland, T., van Noordwijk, M., & Boedihartono, A. K. (2019). Discourses mapped by Q-method show governance constraints motivate landscape approaches in Indonesia. *PLoS One*, 14(1), e0211221.
- Liu, J., Herzberger, A., Kapsar, K., Carlson, A. K., & Connor, T. (2019). What Is Telecoupling? In C. Friis & J. Ø. Nielsen (Eds.), *Telecoupling* (pp. 19–48). Springer International Publishing. https://doi.org/10.1007/978-3-030-11105-2_2.
- Living Income Community of Practice The concept of living income 2020 <https://www.living-income.com/the-concept>.
- Loučanová, E., Paluš, H., Bálíková, K., Dzian, M., Slašťanová, N., & Šálka, J. (2020). STAKEHOLDERS' PERCEPTIONS OF THE INNOVATION TRENDS IN THE SLOVAK FORESTRY AND FOREST-BASED SECTORS. *Journal of Business Economics and Management*, 21(6), 1610–1627. <https://doi.org/10.3846/jbem.2020.13503>.
- Mithöfer, D., Rossetto, J. M., Donovan, J. A., Nathalie, E., Robiglio, V., Wau, D., ... Blare, T. (2017). Unpacking 'sustainable' cocoa: Do sustainability standards, development projects and policies address producer concerns in Indonesia, Cameroon and Peru? *International Journal of Biodiversity Science, Ecosystem Services & Management*, 13(1), 444–469. <https://doi.org/10.1080/21513732.2018.1432691>.
- Morel, A. C., Hiron, M., Adu Sasu, M., Quaye, M., Ashley Asare, R., Mason, J., ... Norris, K. (2019). The Ecological Limits of Poverty Alleviation in an African Forest-Agriculture Landscape. *Frontiers in Sustainable Food Systems*, 3, 57. <https://doi.org/10.3389/fsufs.2019.00057>.
- Morse, S., McNamara, N., & Acholo, M. (2009). *Sustainable livelihood approach: A critical analysis of theory and practice*. In: *Geographical Paper No. 189*. University of Reading. <https://www.reading.ac.uk/web/files/geographyandenvironmentalscience/GP189.pdf>.
- Nhem, S., & Lee, Y. (2020). Exploring perspectives in assessing the quality of governance of the Reducing Emissions from Deforestation and Forest Degradation (REDD+) pilot project in Cambodia: Use of Q Methodology. *Journal of Mountain Science*, 17(1), 95–116. <https://doi.org/10.1007/s11629-018-5301-y>.
- Nijnik, M., Nijnik, A., Bergsma, E., & Matthews, R. (2014). Heterogeneity of experts' opinion regarding opportunities and challenges of tackling deforestation in the tropics: A Q methodology application. *Mitigation and Adaptation Strategies for Global Change*, 19(6), 621–640. <https://doi.org/10.1007/s11027-013-9529-0>.
- Nijnik, M., Nijnik, A., Sarkki, S., Muñoz-Rojas, J., Miller, D., & Kopy, S. (2018). Is forest related decision-making in European tree-line areas socially innovative? A Q-methodology enquiry into the perspectives of international experts. *Forest Policy and Economics*, 92, 210–219. <https://doi.org/10.1016/j.forpol.2018.01.001>.
- Nordhagen, S., Pascual, U., & Drucker, A. G. (2021). Gendered differences in crop diversity choices: A case study from Papua New Guinea. *World Development*, 137. <https://doi.org/10.1016/j.worlddev.2020.105134>.
- NYDF Assessment Partners. (2020). *Progress on the New York Declaration on Forests. Balancing forests and development Addressing infrastructure and extractive industries, promoting sustainable livelihoods, Goals 3 & 4 Progress Report*. <https://674644-2215740-raikfcquaxqncqfpm.stackpathdns.com/wp-content/uploads/2021/10/2020NYDFReport.pdf>.
- Oomes, N., Tieben, B., Ammerlaan, T., Appelman, R., Biesenbeek, C., & Buunk, E. (2016). Market Concentration and Price Formation in the Global Cocoa Value Chain. (SEO-rapport ; No. 2016-79). *SEO Economisch Onderzoek*. <http://www.seo.nl/pagina/article/market-concentration-and-price-formation-in-the-globalcocoa-value-chain/>.
- Analytica, O. (2020). *Ghanaian cocoa prices point to LID implementation (Emerald Expert Briefings)*. [Emerald Expert Briefings].
- Phelps, J., Zabala, A., Daeli, W., & Carmenta, R. (2021). Experts and resource users split over solutions to peatland fires. *World Development*, 146. <https://doi.org/10.1016/j.worlddev.2021.105594>.
- Raum, S., Rawlings-Sanaei, F., & Potter, C. (2021). A web content-based method of stakeholder analysis: The case of forestry in the context of natural resource management. *Journal of Environmental Management*, 300. <https://doi.org/10.1016/j.jenvman.2021.113733>.
- Ruben, R. (2021). Strong need to improve cocoa governance. *Linked In*. <https://www.linkedin.com/pulse/strong-need-improve-cocoa-governance-ruerd-ruben>.
- Ruben, R., & Fort, R. (2012). The Impact of Fair Trade Certification for Coffee Farmers in Peru. *World Development*, 40(3), 570–582. <https://doi.org/10.1016/j.worlddev.2011.07.030>.
- Scoones, I. (2009). Livelihoods perspectives and rural development. *The Journal of Peasant Studies*, 36(1), 171–196. <https://doi.org/10.1080/03066150902820503>.
- Shaffer, P. (2013). Ten Years of "Q-Squared": Implications for Understanding and Explaining Poverty. *World Development*, 45, 269–285. <https://doi.org/10.1016/j.worlddev.2012.12.008>.
- D. Skolidou In or out?: Exploring selection processes of farmers in cocoa sustainability standards and certification programmes in Ghana [Doctoral, University of East Anglia] 2019 10.13140/RG.2.2.28002.58560.
- Smith, S., & Sarpong, D. B. (2018). Living Income Report Rural Ghana: Cocoa growing areas of Ashanti, Central, Eastern, and Western Regions. *University of Ghana*. https://sustainablefoodlab.org/wp-content/uploads/2018/07/Living-Income-Report_Ghana-Cocoa_Draft-v2_Clean.pdf.
- Sneddon, C. S. (2000). 'Sustainability' in ecological economics, ecology and livelihoods: A review. *Progress in Human Geography*, 24(4), 521–549. <https://doi.org/10.1191/030913200100189076>.
- Sousa, D., & Daniel, J. (2018). qsort R package: A New Tool for Scoring Q-sort Data. *Journal of Open Source Software*, 3(32), 911. <https://doi.org/10.21105/joss.00911>.
- Stanbury, P., & Webb, T. (2021). Cocoa and smallholders: The Living Income Differential is a failure, so where next? *Sustainable Smart Business*. http://sustainablemartbusiness.com/cocoa-and-smallholders-the-living-income-differential-is-a-failure-so-where-next/?fbclid=IwAR3ivtwq8-dffKc7mij_6LzhkAxz7n8PGJ1J8WEGPcRg8kfmZp003_BHBaC.
- Teye, J. K., & Nikoi, E. (2021). *The Political Economy of the Cocoa Value Chain in Ghana*. Institute of Development Studies (IDS). <https://doi.org/10.19088/APRA.2021.007>.
- E.L. Tompkins A. Mensah L. King T.K. Long E.T. Lawson C. Hutton ... N. Bood An investigation of the evidence of benefits from climate compatible development 2013 10.13140/RG.2.1.2938.7602.
- Tröster, B., Staritz, C., Grumiller, J., & Maile, F. (2019). *Commodity dependence, global commodity chains, price volatility and financialisation: Price-setting and stabilisation in the cocoa sectors in Côte d'Ivoire and Ghana*. ÖFSE Working Paper.
- Undp (2017). *Application of the Sustainable Livelihood Framework in Development Projects*. Panama City, Panama: A Guidance Note. United Nations Development Programme. <http://www.latinamerica.undp.org/>.
- van Vliet, J. A., Slingerland, M. A., Waarts, Y. R., & Giller, K. E. (2021). A Living Income for Cocoa Producers in Côte d'Ivoire and Ghana? *Frontiers in Sustainable Food Systems*, 5. <https://doi.org/10.3389/fsufs.2021.732831>.
- Vigneri, M., & Kolavalli, S. (2018). *Growth through pricing policy: The case of cocoa in Ghana*. Food and Agriculture Organization of the United Nations, Rome: Background paper for UNCTAD-FAO Commodities and Development Report.
- Waarts, Y. R., Janssen, V., Aryeetey, R., Onduru, D., Heriyanto, D., Aprillya, S. T., ... Ingram, V. J. (2021). Multiple pathways towards achieving a living income for different types of smallholder tree-crop commodity farmers. *Food Security*, 13(6), 1467–1496. <https://doi.org/10.1007/s12571-021-01220-5>.
- Waarts, Y. R., Janssen, V., Ingram, V. J., Slingerland, M. A., van Rijn, F. C., Beekman, G., ... van Vugt, S. M. (2019). *A living income for smallholder commodity farmers and protected forests and biodiversity: How can the private and public sectors contribute?* Wageningen Economic Research: White Paper on sustainable commodity production. <https://edepot.wur.nl/507120>.
- Walters, D. (2021). *Chocolate crisis: Climate change and other threats to the future of cacao*. University of Florida Press.
- Watts, S., & Stenner, P. (2005). Doing Q methodology: Theory, method and interpretation. *Qualitative Research in Psychology*, 2(1), 67–91. <https://doi.org/10.1191/1478088705qp0220a>.
- Winkel, G., Sotirov, M., & Moseley, C. (2021). Forest environmental frontiers around the globe: Old patterns and new trends in forest governance. *Ambio*, 50(12), 2129–2137. <https://doi.org/10.1007/s13280-021-01647-2>.
- Zabala, A. (2014). qmethod: A Package to Explore Human Perspectives Using Q Methodology. *The R Journal*, 6(2), 163. <https://doi.org/10.32614/RJ-2014-032>.
- Živojinović, I., & Wolfslehner, B. (2015). Perceptions of urban forestry stakeholders about climate change adaptation – A Q-method application in Serbia. *Urban Forestry & Urban Greening*, 14(4), 1079–1087. <https://doi.org/10.1016/j.ufug.2015.10.007>.