

Joining the dots of Informality and Climate Change:

A Discussion Paper for Practitioners

ABSTRACT

The purpose of this document is to highlight the impact of the informal sector in select cases and to demonstrate the need for climate practitioners to factor-in the informal economy into climate change mitigation in order to have more inclusive and effective GHG reduction measures. The study starts by examining the informal economic sectors of member states of the Pacific Alliance (Colombia, Chile, Mexico, and Peru) and concludes by showcasing Informality in the Brick Industry, Informal Taxis, Informal Alluvial Gold Mining and Informality barriers to implement Carbon Tax Instruments. A series of discussion questions are then proposed in order to inspire future contributing research on this topic.

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Disclaimer: The authors of this document do not attempt to provide a complete picture of informality in each country, instead they have prepared this note to kick-start an open and transparent discussion with stakeholders. The views expressed here do not necessarily represent the postures of PIR members, Pacific Alliance Countries, Konrad Adenauer Stiftung or its stakeholders.

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ACRONYMS

CDM:	Clean Development Mechanism of the Kyoto Protocol
COP:	Conference of the Parties of the UNFCCC
EELA:	Program for Energy Efficiency in Artisan Brick Makers
GHG:	Green House Gases
IMF:	International Monetary Fund
INDC:	Intended Nationally Determined Contributions
IPCC:	Intergovernmental Panel on Climate Change
KAS:	Konrad Adenauer Stiftung
MADS:	Ministry of Environment and Sustainable Development of Colombia
MGI:	McKinsey Global Institute
MINAM:	Ministry of Environment of the Republic of Peru
MOP:	Conference of the Parties of the Kyoto Protocol
PIR:	Program for Responsible Investments
SEMARNAT:	Secretariat of Environment and Natural Resources of Mexico
UNFCCC:	United Nations Framework Convention on Climate Change
UNPRI:	Principles of Responsible Investments backed by the United Nations
WB:	World Bank

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About the Pacific Alliance

The Pacific Alliance is an initiative of regional integration formed by Chile, Colombia, Mexico and Peru, officially established on April 28th, 2011. Its objectives are:

- Build in a participatory and consensual way, an area of deep integration to move progressively towards the free movement of goods, services, resources and people.
- Drive further growth, development and competitiveness of the economies of its members, focused on achieving greater well-being, overcoming socioeconomic inequality and promote the social inclusion of its inhabitants.
- Become a platform of political articulation, economic and commercial integration and projection to the world, with emphasis on the Asia-Pacific region.

About PIR

The Program for Responsible Investments (PIR) is a peer-to-peer advocacy and capacity building platform for institutional investors interested in the development of sustainable capital markets and responsible investment practices in Latin America. PIR has technical secretariats in Santiago, Lima, Bogota, Mexico City, Buenos Aires and London.

PIR supports its members to develop responsible investment policies, Environment, Social and Corporate Governance (ESG) analytical capabilities and portfolio de-carbonization strategies. PIR is an official Network Supporter of the Principles for Responsible Investment (UNPRI) for Latin America.

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INTRODUCTION

This discussion note highlights cases where economic informality affects the response to climate change. The authors of this paper have reviewed data and background knowledge published in peer reviewed publications and mass media in the subject of informality and through their participation at the Sepia Forum on Informality¹ on August 2015, have interviewed experts from diverse institutions including GRADE, Peruvian Institute of Municipal Administration (IPAM), Clark University and the Peruvian Society for Environmental Law (SPDA). The following paragraphs review the main concepts and views on economic informality.

There are many definitions of informality² among social scientists, policy makers and academics. The most widely known definition of informality was introduced in a 2008 article³ published by Rafael La Porta and Andrei Schleifer. The referred article defines informal economic activity as “conducted by unregistered firms or by registered firms but hidden from taxation”. In a

similar approach, a 2010 article⁴ written by Schneider et al. presented a check list for the identification of informal economic activity. Under this definition, informal firms intentionally hide their operations from public authorities in order to achieve any of the following:

- Avoid payment of income, value or other taxes.
- Avoid the payment of social security.
- Avoid compliance with legal labor standards such as minimum wage, maximum working hours, safety standards etc.
- Avoid completing mandatory administrative procedures like completing statistical questionnaires or administrative forms.

The above definition assumes that informal economic activity is intentional and only conducted by firms. This definition clashes with other studies concluding that informality is a consequence of poverty, and not the result of active decision making by business owners or employees. This second view sees informality neither as a stimulus for firms to achieve more streamlined success in the marketplace nor as an unfair and immediate threat to formal operations. This view⁵ sees formal and informal economies as operating parallel to one another with very little interaction or competition between the two; they are completely separate entities acting in different market segments: “In this dual view, development comes from formal firms. The label of informality

1 http://sepia.org.pe/facipub/upload/cont/1058/cont/files/PROGRAMA%20FINAL_%20SEPIA%20XVI.jpg

2 The label of informality has been widely used without much rigor. Sometimes, terms such as informal economy, illegal economy, shadow economy and unreported economy are frequently used interchangeably leading to confusion. As we will see later in the case of informal mining, each country defines informality in the context of the scale and location of operations. A study by the International Monetary fund makes the distinction between the illegal economy and the unreported economy which can both be described as “informal”. According to IMF, the illegal economy refers to all income which is produced via economic activities pursued in direct violation of legal statutes (IMF3); the drug trade may be included in this category. The unreported economy refers to both legal and illegal economic activity which ignores or evades legal regulations, tax laws and any other government mandated controls (IMF3).

3 La Porta and Shleifer.

4 Schneider et al.

5 La Porta, Schleifer 2014, 110

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Note that none of the above definitions include additional climate stakeholders: informal individuals and entities that incentivize informality.

Some authors such as Hernando de Soto⁶, see informality as a positive phenomenon with an aggregated impact in the global economy providing jobs for billions of people, especially in developing countries and in sectors such as agriculture. This posture considers that taxation, licenses and permits can inhibit the development of businesses. According to this particular view, informal firms flourish because they do not face any restrictions, thus increasing their productivity and probability of success in

⁶ The Other Path by Hernando de Soto. Harper & Row Publishers, Inc. 1989.

the marketplace.

Negative viewpoints on informality exist as well. These views see informal firms as unproductive and small not because they are deprived of official status, but because they lack the human capital necessary to run an efficient business.

The Parasite view, associated largely with the McKinsey Global Institute⁷ sees informal firms as harmful to the success of formal firms, given their unfair advantage of not having to abide by government standards, pay taxes etc. This view⁸ sees informal and formal firms as direct competitors with similar products and customer base. "The cost advantage conferred by avoiding taxes and regulations allows unofficial firms to undercut official firms in prices. Informal firms then hurt growth both because their small scale makes them unproductive and because they take away market share from bigger, more productive formal competitors." This view also sees government eradication of informal firms and the increase of audit capabilities as the solution to this supposed problem. In addition Norman Loayza⁹ describes informal firms as harmful due to their use of public infrastructure and resources without investing back into the public entities which they utilize. This view complements the McKinsey view that informal firms are harmful and parasitic.

According to most literature¹⁰ formal firms and informal firms have very distinct characteristics. Formal firms range in size from small to large. They are managed by educated and highly qualified entrepreneurs.

7 The hidden dangers of the informal economy, Diana Farrell, MGI 2004.

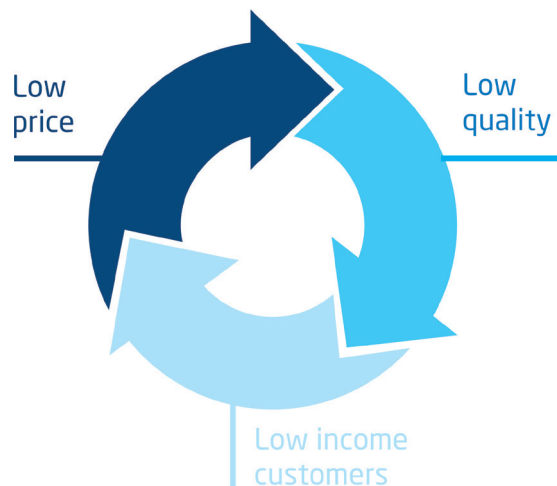
8 La Porta and Schleifer, 4

9 Loayza 46

10 La Porta, KAS, Loayza, BBVA.

They pay taxes and comply with government standards in order to reach a wider customer base and manage larger amounts of capital. Most literature reviewed depicts informal firms as small, unproductive and run by uneducated entrepreneurs. They characterize their products and services as low-quality, targeted for low-income customers for low prices.

Figure 1. The vicious cycle of informality



Reviewed literature report a negative correlation between economic development of a region and the percentage of the economy which is dominated by informality. According to the reviewed articles, regions that are more economically developed¹¹ tend to have less informality. There is evidence¹² that informal employment falls as the economy grows and develops¹³. Another interesting connection is the rate of informality compared to the percentage of the economy which is comprised of pri-

11 KAS, La Porta, Loayza

12 Heintz and Pollin, 2005

13 Heintz, 14

mary production such as agriculture. Studies have shown that economies with high agricultural activity are also prone to high levels of informality¹⁴. Consequently, as economies shift away from primary production (such as agriculture) to more complex and diverse economic activity, informality tends¹⁵ to decrease.

A large fraction of the reviewed literature, support the view that informal firms are small, unproductive and poorly managed by uneducated entrepreneurs. According to the 2007 World Bank study¹⁶ the many factors which may contribute to informality can be segmented into two general categories: Escape or exclusion.

The concept of **escape** is based on the assumption that actors make a conscious decision to deliberately leave the formal sector in order to continue operations in the informal sector. Alternatively, entrepreneurs may decide to start their business in an informal way and never enter the formal sector; this too is a conscious decision made by the business owner or employee. The reasons for this decision may vary, but the consensus among most literature is that actors will choose to operate in the informal sector with the intention of avoiding compliance with government mandated requirements, which are inherently burdensome to business. A 2010 study¹⁷ examines informality and explores the potential causes, all of which can be defined as “escape oriented” factors. Schneider names three factors which incentive firms to go informal. They include: tax and social security contribution burdens; intensity of regulations; and public sector services.

14 ILO

15 IMF, KAS, Loayza

16 Perry et al

17 Schneider et al

Literature shows positive correlations¹⁸ between the levels of tax evasion and informality. Schneider¹⁹ states that “The bigger the difference between the total cost of labor in the official economy and the after-tax earnings (from work), the greater the incentive to avoid this difference and to work in the shadow economy.” In other words, workers may choose to work for an informal firm in order to recover the costs in their wages which would otherwise be paid in taxes. By the same token, entrepreneurs may rather operate informally if it means that they can keep all of their pre-tax profits.

Entrepreneurs may also see labor regulations and administrative procedures as major hindrances for the successful operation of their businesses. The level of rigidity and strictness imposed by labor regulations varies greatly by country. Some literature has shown that countries which impose fewer and more flexible labor regulations receive much higher enrollment into the formal sector. Consequently, countries where labor laws are very rigid and restrictive see high levels of informality. This is because labor regulations generally raise costs²⁰ for businesses, so avoiding them may give a short term advantage.

Exclusion is the other major reason which may lead to informality. Exclusion refers to the idea that people do not necessarily want to operate in the informal economy, however existing socio-economic pressures force them into informality.

La Porta and Schaefer²¹ state the biggest cause for informality is poor access to fi-

18 BBVA, IMF, Schneider, KAS

19 Schneider, 5

20 KAS, Schneider, Loayza, Kanbur

21 La Porta, 116

nances, followed by political instability and then poor access to land resources. While lack of finances is a problem which affects formal firms as well, informal firms are usually operated by uneducated entrepreneurs that may come from under-served communities; and it may be harder for these individuals to receive loans or other kinds of funds to start their businesses. Because the start-up costs for informal firms are much lower than formal ones, informality is, for many, the only option. Individuals who work in the informal sector often come from communities which have high levels of poverty and limited access to good education; these individuals are under-qualified to enter the formal sector. A 2012 study²² by James Heintz cites a clear link between informality and respective income levels: "From cross-country data, there appears to be a negative relationship between the relative size of informal activity in the economy and per capita income (e.g. Loayza and Rigolini, Ihrig and Moe, 2001)." According to the theory of exclusion, these social and economic pressures hold²³ these people back from entering the formal economy. "Many informal entrepreneurs would gladly close their businesses to work as employees in the formal sector if offered the chance, even if the wages in the formal sector are taxed while income in the informal sector is not. Few of them have this opportunity."

Informality in Latin America

Latin America is a region with high levels of informality²⁴ relative to the rest of the World. The causes which lead to informality in Latin America can be described as both

structural and institutional²⁵. On the structural side, most Latin American countries have underdeveloped economies, with a limited government capacity to enforce full compliance with laws. In Latin America, formal markets may not adequately serve all citizens, geographical areas and activities. Primary production²⁶ makes up a large percentage of the economies of Latin America. Education systems²⁷ are not exemplary and while statistics²⁸ vary from country to country, poverty levels in Latin America are generally very high.

In addition to these structural factors, much of informality in Latin America can be attributed to "escape" due to institutional factors. Latin American countries, like most other developing countries have very strict and complex labor requirements but lax enforcement. Taxes are often stringent and costly. In addition, the perception of public sector services quality in Latin America is very low, and many people do not have faith in their governments to allocate the public budget appropriately. The result is high informality in these countries²⁹. "For example, in the early 1990s, while 94 per-

25 Loayza further categorizes the causes of informality into institutional and structural factors. Institutional factors may refer to the law and order, regulatory freedom allowed by government. Other institutional factor explored in a 2009 study by Ravi Kanbur is the role of enforcement and informality. Countries where governments do not have the capacity to enforce tax and labor regulation compliance will generally have higher levels of informality because the people are less likely to receive consequences for disobeying the law. Structural factors are those which are explored by La Porta and Schneider and are often associated with exclusion. These factors include socio-demographic and economic pressures such as education level, poverty level, access to finances, access to land etc.

26 IMF

27 KAS, BCR

28 KAS, CIA World Fact Book, World Bank Database

29 IMF, 3

22 Heintz, 14

23 La Porta 2014, 112

24 BBVA, Heintz, IMF, KAS

cent of the labor force contributed to the social security system in the Netherlands, this percentage was only about 19 for Honduras". Many Latin American governments are also unable to effectively enforce taxation and labor regulations, so firms will choose³⁰ to evade taxes and disobey labor laws simply because they do not fear the consequences from the government.

In this paper we highlight cases where informality has been triggered by gaps in governmental supervision, reporting or enforcement or by championing indirectly informal practices (brick manufacturing, alluvial gold mining, taxis, etc.)

For the sake of simplicity, this paper considers informality for three basic types of economic agents: the individual, the firm and the institution. It is important to make this distinction from the very beginning since it will allow us, for example, to understand why some countries with low informality levels³¹ still show a high degree of informality for an economic segment mostly comprised by self-employed workers.

Going beyond the firm³², this paper introduces two other informality agents: the individual and the institution.

The individual: An individual can take either or both of the following roles in an informality case:

- I. Self-employee. The self-employee category may range from the

30 KAS, Kanbur

31 Chile shows the lowest informality level in comparison to Peru, Colombia and Mexico for most economic sectors.

32 While many startups begin their activities in a partially informal way, the education of its leaders usually determines which stay informal and reach a glass ceiling, and which scale-up and become fully formal and competitive firms.

independent worker (physician, freelance programmer, electrician, janitor, gardener, etc.) to the one-person business (grocery store, interior designer, furniture maker, taxi driver, tailor, etc.) and the entrepreneur that starts informal, but aims to develop a fully formal business. According to the International Labor Organization (ILO) 127 million of Latin Americans, 47% of the labor market, belong to this category.

- II. Firm Employee. Besides showing informality on income reporting, input procurement or output selling, the main entry point for business in the informality world is labor informality. The quality of public sector services is also a very large influence³³ on informality. Taxes and labor regulations may require that a percentage of profits and/or wages be used to pay for public services. However if the individual and the firm perceive that these services are not worth the cost of taxes, then individuals will often be incentivized to accept informal employment conditions in lieu of savings on social security and taxes payments. In countries where the government is viewed as inefficient, corrupt and unable to allocate public revenue effectively, businesses will be reluctant to pay for these programs. Therefore the quality of public services and the perception of government effectiveness is a major influence on the rate at which people evade taxes and labor regulations, and operate

in the informal sector.

The Institution: Institutions can be considered as either governmental or non-governmental not-for-profit organized formal groups of society. Although formal by nature, they are not immune to informality as evidenced by the documented cases of this paper. We will show that due to a number of factors, institutions may end up working in an informal way or not fully abiding to the laws and rules applicable to them.

Informality and Climate Change

One of the big governance challenges³⁴ to implement INDCs is the high degree of informality in developing countries and emerging economies. This is particularly relevant for key emission sources such as land use and land use change. Literature states³⁵ that informal economic actors are not fully supervised nor do they abide by regulations, making participation and compliance with INDCs and general responses to climate change not very feasible.

Although informality has been examined through different lenses in previous literature, very few studies have analyzed informality as a barrier to a low emission and climate resilient development. We have

³⁴ As a response to these challenges, a partnership has been formed by the Konrad Adenauer Foundation (KAS) and Programa de Inversión Responsable (PIR) to engage in the development of this discussion paper to kick start discussions on Informality and Climate Change.

³⁵ During COP20, business organizations underlined the critical barrier of Informality as the most challenging condition found in Pacific Alliance Countries to achieve successful implementation of development measures in general and climate change mitigation and adaptation action in particular.

reviewed existing literature on the subject, including concepts, indicators, factors that shape informality and public policy approaches to informality and climate change in the Pacific Alliance.

The following paragraphs characterize the informality context for each country of the Pacific Alliance:

Colombia

According to a 2014 study conducted by BBVA approximately 56.8 percent of the Colombian economy is made up of informal activity. A report by Konrad Adenauer Stiftung (KAS) documents that informality has dropped from 61 percent in 2001 to 55 percent in 2008. According to the World Bank, Colombia's population that lies beneath the poverty line is approximately 30.6 percent.

According to the CIA World Fact Book 17 percent of the country's labor force works in agriculture. In Colombia most informal firms are small and very young. They are operated by uneducated entrepreneurs, usually men between the ages of 35 and 44, though informality is found in both sexes and across all ages. Certain sectors have particularly high rates of informality in Colombia. As of 2008 the rate of informality in agriculture was 73.3 percent; construction was at 67.9 percent and commercial industries such as restaurants and hotels were at 70.5 percent (KAS, 63)

The economy of Colombia has grown substantially during the past decade and informality has fallen in accordance with this increase in development, however the problems which cause informality are still

very present, mostly on the institutional level; there are structural elements which contribute to informality as well.

The initial procedures to register a firm in the formal economy can be time consuming and costly, especially for small and young firms. In Colombia, firms are driven away from formality because abiding by regulations is costly and taxes can be a very expensive relative to the initial budgets for new firms. Some economists suggest that there should be tax cuts and relaxed regulations for new firms as a means to bring more new businesses into the formal sector.

Another problem in Colombia's regulatory system which leads to escape from formality is the healthcare system. Formal firms have to allocate a portion of their revenue to public services such as healthcare. However, many salaried employees see the costs of healthcare to outweigh the benefits. Thus workers would rather recover³⁶ the percentage of their wages which would be given to government programs such as social security or healthcare. This problem in revenue collection forms a vicious cycle: Because the government can only tax about 45 percent of firms, tax rates have to be higher in order to make up for the costs of evasion; this raise in taxes is a further incentive to leave the formal sector and choose informality instead.

If Colombia were to lower taxes and relax regulations, more firms may opt to register formally, however the initial decrease in revenue obtained by the government would result in a decrease in quality in public services which could also de-incentive firms to join the formal sector.

³⁶ KAS, 64

Mexico

Mexico also has a very high level of informality: approximately 54 percent of the economy is informal according to a 2014 study developed by BBVA. KAS estimates a similar rate. Poverty in Mexico is very high, around 52.3 percent according to the World Bank. Additionally, The CIA World Fact Book estimates that agriculture employs about 13.4 percent of the labor force. The Mexican economy is large, but there are about eight million people who are currently seeking work. This large number presents a serious challenge for job creation in the formal sector.

Even though there is a very large labor force, formal employment stagnates due to a number of institutional problems. Informality is seen much more with small and micro sized firms. This notion is linked to the percentage of workers who do not receive social security³⁷ in Mexico: 93 percent of workers at micro-firms do not receive social security; 31 percent of workers at small firms do not receive social security, however only 5 percent of workers at large firms do not receive social security.

Social security taxes are also very high in Mexico, partially due to the very high levels of evasion and the subsequent need to raise taxes in order to pay for social services. Canada takes about 12 percent tax for social security, 19 percent for the U.S., however Mexico's tax is set at 31 percent. The lower rates in Canada and the U.S. can be explained by a much larger tax base due to less evasion and a better perception of public sector services. In Mexico, high taxes like these can be avoided by working outside of the formal sector.

It is generally more difficult for smaller firms to abide by Mexico's rigid labor regulations and pay the relatively high tax rates. One problem with formal employment in Mexico is that it is extremely costly to fire employees. If a company has to conduct lay-offs each employee who is let go must be compensated three months' pay as well as 20 days of pay for each year worked at that company. Workers with more than 15 years of service at a company will receive an additional 15 day pay per year worked. The result is that even in times of growth, companies will not hire new employees in order to spare the risk of having to let them go in the future. Therefore this makes it harder to find a new job as a salaried worker in the formal sector, and also is an incentive for entrepreneurs to initialize business outside of the formal sector. (KAS,100)

Labor regulations which relate to operation standards and codes also are burdensome to businesses. The IMSS, which is in charge of social protection of Mexican workers will strictly enforce labor codes and regulations to ensure the health and protection of workers. While this is beneficial for the welfare of the workers, any violations of labor regulations will result in hefty fines for the business. This presents another reason for firms to operate outside of the formal sector.

Data published by the Centro de Estudios Economicos del Sector Privado (CEESP) shows that Mexico's extremely high labor rigidity is directly linked to the low productivity of the labor force (KAS,100). To summarize, very rigid labor regulations and high taxes are a large part of what drives informality in Mexico.

³⁷ KAS, 98

Peru

According to BBVA, Peru is the country in this study with the highest rate of informality at around 68.8 percent of the economy. Astoundingly, informality in Peru has decreased substantially since 2001 when levels were around 78 percent (KAS). According to the World Bank, poverty in Peru is at 23.9 percent. 25.8 percent of the labor force works in agriculture according to the CIA World Fact Book. Informality in Peru is very complex and rooted in severe institutional and structural issues.

The majority of informality in Peru is a result of three broad issues: Rigid and inefficient regulations, poor government efficiency, and very poor education. Administrative procedures in Peru are convoluted and time consuming. The registration process for a new business in Peru is very complex, pain staking and inefficient. Doing Business (2010) ranks Peru as 112 out of 183 countries with regard to ease of starting a business. In Peru, it takes 41 days and 9 registration processes to register a business with the State, compared to New Zealand where it takes 1 day and 1 process. In order to avoid cumbersome paperwork which takes a long time to process, business owners often choose informality instead.

Labor regulations, much like those of Colombia and Mexico, are extremely rigid and impact productivity and discourage formality. Much like in Mexico, in Peru it is very risky to hire new employees in the formal sector because it is so difficult and costly to fire them. Doing Business ranks Peru 112 out of 183 regarding flexibility of labor regulations; this puts Peru as one of the most rigid countries in Latin America.

According to Tokman (1992) the additional cost related to following rigid labor regulations is the number 1 deterrent for small businesses to enter the formal sector.

Paying taxes is also not only costly but extremely time consuming and inefficient in Peru. Approximately 40.3 percent of revenue is taxed from businesses. Complying with tax procedures also requires an average time commitment of 380 hours. (KAS, 118)

Government inefficiency in enforcing regulations is also a reason why businesses go informal in Peru. When governments lack the capacity to monitor the compliance with labor regulations or enforce tax payments, firms will have no incentive to go formal. In other words if the State is effective at enforcing regulations, informality is more easily detected, and businesses owners have further incentive to go formal in order to avoid the closing of their business. Loayza³⁸ finds a negative correlation between the capacity for government to enforce and comply with regulations and the level of informality with the economy. A broken judicial system and high corruption compound³⁹ the Peruvian government's incapacity to enforce laws.

A more structural cause of informality in Peru is the very poor educational system in the Country. A good education system is fundamental in producing high-level human capital, and capable entrepreneurs to lead efficient and productive businesses. Higher productivity is a result of better management, usually by educated entrepreneurs; this leads to more efficient business and lower costs which often leads to

38 Loayza, 2007

39 KAS, 118

formality. However, Peru has some of the lowest quality educational institutions even for regional standards. According to the Global Competitiveness report of 2009 - 2010 the primary education system of Peru is ranked 131 of 133 analyzed countries; general education is ranked at 130 out of 133. According to ENAHO⁴⁰ (2008), the matriculation rate for the population between the ages of 6 and 11 is 98.2 percent, and 12 to 16 years old is 90 percent, making the education problem not a matter of access but of quality. Many authors⁴¹ concur that the poor quality of education in Peru generates uneducated entrepreneurs which are largely linked to the informal economy.

Chile

Chile has one of the lowest levels of informality in Latin America. BBVA estimates that only about 30 percent of the Chilean economy is informal. KAS distinguishes that 25 percent of salaried workers are informal, whereas 71 percent of self-employed professionals are informal. Chile has a relatively low poverty rate at around 14.4 percent according to the World Bank. According to the CIA World Fact Book, 13.2 percent of the Chilean labor force works in agriculture, the lowest percentage among the Pacific Alliance countries. Informality has been decreasing in Chile's economy, despite the increase in regulations. While informality is not a pressing problem in Chile as it is in the other countries examined in this study, there are still some factors which maintain the informal economy in Chile.

Chile's low informality can be attributed to the relatively flexible labor regulations. The Chilean government ensures the protection

40 National Institute for Statistics (INEI) of Peru

41 KAS, La Porta and Schleifer

of its workers while also granting businesses more freedom with hires, fires and overtime wages. Unlike other countries, sub-contractors and part time workers are required to register with the state and are ensured social protection and benefits. In Chile the quality of public services is relatively high and is generally trusted by the people of Chile; this too incentivizes salaried workers to give a portion of their wages to social security and healthcare etc.

Although Informality is low, there are still problems which continue to maintain informality in Chile. One major dynamic of informality in Chile is that of self-employment. Not until the pension reform of 2009 was it required for self-employed workers to pay into the pension system. Therefore a culture of self-employment is very established in Chile. However many self-employed people operate their businesses informally. Most of these entrepreneurs have experience in the formal sector and decide to go on their own to avoid costs and have a more flexible work schedule.

Informality in sectors like domestic work (housekeeping, childcare, gardening etc.) is relatively high at around 60 percent. Most of these workers are also self-employed, have low education levels and often come from economically suppressed backgrounds and/or foreign countries. Other structural problems also lead to informality such as lack of access to credit and limited political voice. These structural issues exclude individuals from poorer communities from entering the formal sector. Alike other countries examined in this study, poverty and education level are linked to informality.

Select Cases on Informality

This section describes, analyzes and provides open questions to kick-start discussions and dialogues in Pacific Alliance countries. The following cases, where the relationship between climate change and informality is exposed, have been identified in the Pacific Alliance countries and are included in this paper:

- Informality challenges to the implementation of carbon tax instruments.
- Informality in the brick industry.
- Informal Taxes.
- From Artisan Alluvial Gold Mining to Large Scale Informal Mining.

Informality in the Brick Industry

Construction has been identified as one of the engines for economic growth across the Pacific Alliance countries. However, along the value chain of construction we find elements affected by informality, including those of compliance, completeness of standards⁴² and norms of manufactur-

⁴² Several CDM Projects in the brick industry were unable to complete validation processes due to the absence of standards for dimensions and composition of clay products preventing the comparison of products specifications before and after GHG reduction activities. Existing standards are limited to mechanical properties. However, even those standards are hardly met by the informal sector. For example, according to Indecopi, the norms and standard bureau of

ing. One of these elements is brick production, an important area where substantial emission reductions can be made.

Recent studies show that implementing more efficient technologies, mainly during the firing of bricks, can result in GHG emissions reductions from 10 to 50%, depending on the process, scale and fuel used. The Pacific Alliance countries have a considerable number⁴³ of brick production facilities, including 17,000 in Mexico, 300 in Chile, 2,453 in Colombia and 2,222 in Peru.

In these countries, the brick-making sector is characterized by low energy efficiency, poverty and producers operating in the informal sector, who are barely recognized in social, economic or environmental public policies. What is needed are strategies to engage small producers to formalize the sector through public policies. Special attention also needs to be given to demonstrating health and livelihood benefits of formalization in order to transform the sector.

Technology upgrades will go hand in hand with increased access to modern energy sources. In the sense of a holistic mitigation strategy, considerations will go beyond improving the brick production processes towards considering the use of less energy and resource intensive construction products (e.g. use of hollow bricks etc.)

Peru, the hardness and mechanical resistance of bricks must be 130 kg/cm², but a sampling of informal products show that they barely reach a resistance of 75-85 kg/cm². Considering that all Pacific Alliance countries are exposed to seismic activity of the Pacific Fire Rim, strict compliance of standards is critical. On the other hand, formal brick production shows resistance of around 200 kg/cm² fully complying with the minimum specifications of the standard.

43 www.ccacoalition.org

According to EELA, poor technology is widespread in the region, which is reflected by the low levels of kiln capacity and production, with the exception of Brazil and Colombia that have production areas with semi-automatized technology and more efficient kilns, Brazil leading the region. In Peru and Bolivia some brick production facilities have implemented improved technologies, while others still use manual production processes.

According to the Ministry of Production of Peru, 82.7% of the demand for informal bricks comes from individual-scale construction, a market segment very sensitive to price variations and with poor compliance to construction standards and permits.

Artisanal brick producers in Latin America use highly pollutant fuels in kilns with low energy efficiency. Wood, tires and plastics, among other fuels, are used to fire bricks, contributing to air pollution and deforestation.

Brick production in Mexico is distributed amongst a large number of micro producers. Informal producers use highly pollutant and carbon intensive fuels. Most emission inventories for the brick industry consider them an area source. Research activities in Mexico reported big differences between official information (reported to government) and that estimated by specific studies.

The Clean Development Mechanism (CDM) of the Kyoto Protocol provided a market based stimulus to reduce emissions in the brick industry. However, important challenges were found especially the lack of standards and norms for product specifica-

tion. When Designated Operational Entities (DOEs) performed validation and verification services on CDM projects from the brick industry, they frequently lacked an official reference benchmark to compare size, composition, energy usage per ton of brick produced, etc. As a consequence, several projects failed to complete validation and verification services, preventing access to carbon finance.

A large fraction of brick production occurs in an informal setting. This prevents the government from tracking and influencing the GHG emissions of informal brick makers.

Government guaranteed mortgages and low emission bonuses are being considered to boost the delivery of low emission social housing. Informal brick makers would be automatically excluded from this benefit, hence limiting the positive impact of government and private sector efforts.

Informal Taxis

Over the past few decades, the number of motor vehicles in Latin America has increased tremendously due to the physical expansion of urban areas and the facility of buying cars at increasingly affordable prices. The lack of appropriate vial infrastructure in several Latin American countries, the antiquity of present vehicles in the automotive park* and the informality of the existent transport services in some countries, cause the generation of thousands of tons of greenhouse gases that are emitted daily into the atmosphere.

The emission of these gases depends mainly on 3 factors: circulation time, fuel type and the condition of the engine. Gases

emitted from vehicles vary, as the combustion processes for diesel and gasoline fuels result in different gaseous oxide products.

In this section we will focus on the activities of informal taxis in the capital cities of Chile, Peru, Colombia and Mexico and reference country specific data to analyze their contribution to greenhouse gas emissions.

For the purpose of this study informal taxi service providers are defined as individuals who provide taxi services without the proper business registration or agency affiliation. They provide this service with unaffiliated automobiles, which may or may not be up to legal fuel standards. It is estimated that on average, an informal taxi is in service 12-14 hours per day. All exhaust emissions produced during this time period are not accounted for by the State. In addition to complicating legitimate municipal transit systems and potentially inducing high crime levels, the “invisible” emissions produced by informal taxis pollute the air, hinder the quality of life of local residents and contribute to the effects of global climate change.

Within the **Lima** automotive park one in every four vehicles is a taxi: formal or informal¹. According to a 2015 report by the Metropolitan Taxi² Service (SETAME) there are approximately 200,000 taxis within Lima Proper; 90,861 of them are formal and 106,000 informal. Furthermore it has been found that more than 59,000 are independent, 26,500 are station taxis and only 5,000 are limousine services. According to a different study conducted by IPAM, two out of three taxis in Peru are informal³.

According to the Urban Transport Unit of the Municipality of Lima (GTU)*, Fanny Eto,

taxis occupy 72% of available road space and only satisfy 4% of the demand of public transport, which means that out 100 citizens that utilize public transportation only 4 use taxis⁴. In recent years the Latin American automotive fleet has grown substantially, this increase in automobile sales is not unique to Latin America.

Mexico City, has a relatively similar landscape to Peru. Its increase in the number of vehicles is closely linked with the growth of population. This population increase has not been accompanied by the implementation of adequate public transportation services, or proper road infrastructure to accommodate new vehicles. According to a report by the Road Improvement Authority of the Federal District, there is a total of 3,260,919 operating motor vehicles in Mexico City. These nearly 3.5 million vehicles circulate in a deficient, dilapidated road network, which affects travel efficiency, transit time, GHG and polluting emissions.

According to the FIMEVIC, 109,407 vehicles provide the taxi services in Mexico City; it is estimated that around 40,000 vehicles operate informally, from which 20,000 work under the modality of executive services⁵.

Jonathan Verazaluce, technical director of the General Board of Services of Individual Public Transport of the Mobility Department of the Federal District, signaled that the decrease and disappearance of the informal taxis or “pirates”, will be achieved as a consequence of the new Law of Mobility passed in November 2014. This is just one of the concrete actions taken by authorities to reduce the number of vehicles that operate under this modality.

In the case of Colombia, the Single National Register of Traffic (SNRT) indicates that there are about 480,000 taxi vehicles officially registered and 800,000 taxi drivers in the whole country. Bogota has 52,768 vehicles, following Medellin with 19,000, and 27,000 in the municipalities of the Metropolitan Area of the Valle de Aburra. Sources of the Peruvian Institute of Municipal Administration (IPAM) state that the rate of informality within the taxi industry of Bogota is 30%, in comparison with of Lima which lies between 50 and 66.6%.

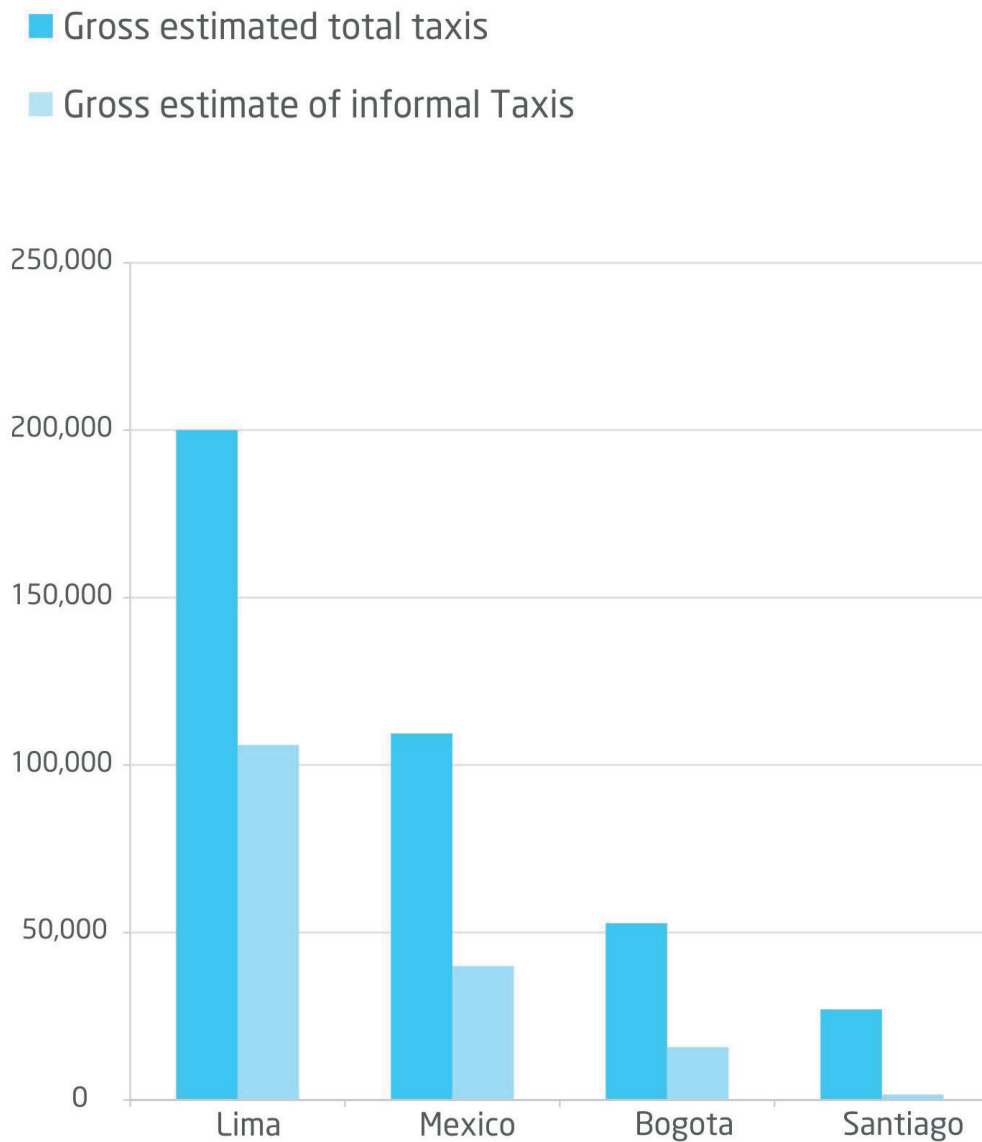
In Santiago de Chile, the automotive fleet has been closed and no more taxi licenses have been issued since 2008; this prevents the entry of more formal taxi vehicles. This measure is an answer to the air pollution issues facing Santiago. The National Confederation of Chilean Taxis indicates that Santiago has 27,000 taxis, with 10,000 at the country level.

“By issuing more taxi licenses, our streets would turn into a jungle as the roads cannot accommodate the current fleet of 1,700,000 private cars in the metropolitan area, and over 4,000,000 at the national level” indicated the president of the National Confederation of Chilean Taxis. She also highlighted that the saturation of the Chilean automotive fleet has caused an increase of polluting gases, causing respiratory damages in the population, mainly in seniors and children.

The Peruvian Institute of Municipal Administration (IPAM), estimates that 6% of taxis in Santiago are informal. Furthermore, there are only 9 taxis per every thousand habitants, but despite this low number, the vehicle fleet in Santiago is still saturated.

According to Louis de Grange, expert in transport at Diego Portales University, "Informal vehicles are not very relevant, because they are still a minority in Santiago. Despite this assertion, the Chilean government seeks to reduce even more, and eliminate informal transport of its streets."

Figure 2: Formal and informal taxis in the cities of Lima, Bogota, Mexico and Santiago.



Source: self-prepared*

Informality in the taxi industry is a recurrent problem for all studied cities, however, the degree of severity varies by city. In Lima, informal taxis are widespread; in Santiago, while the problem exists, it is insignificant*. Informal taxis generate an increase in the GHG emissions, not only from direct emissions, but also from the indirect emissions from other vehicles produced during traffic jams (created in part by informal taxis).

From Artisanal Informal Alluvial Gold Mining to Large Scale Illegal Mining

The price of gold has an upward historic trend. A decade ago, small artisanal gold miners enjoyed government support for its activities through programs designed for small scale mining operations. With the climbing price of gold, alluvial gold mining has received attention from new, organized but illegal groups. This has increased the scale of illegal gold mining activity across Latin America with Peru and Colombia reaching levels rivaling formal mining activities.



Source: goldprice.org

In Madre de Dios, a jungle region in south-east Peru, 97% of local gold production in 2011 came from illegal mining. Miners can earn US\$75 a day, up to five times the amount they might expect from working on a farm. Madre de Dios produces 9.2% of Peru's gold, an estimated 16 tons of gold per year. Mercury⁴⁴, which is typically used to separate gold from

⁴⁴ The water supply has been heavily affected by Mercury. Thirty to forty tonnes of mercury are pumped into rivers in the region each year. Unsurprisingly, it has worked its way through the food chain. By analysing hair samples, another Carnegie study found that 78% of people in Madre de Dios had three times the usual concentration of mercury in their bodies. Some were more than 27 times over the international limit.

ore, is cheap and readily available. Around 2.8 kg of mercury are used per kg of extracted gold. The benefits brought to the State by illegal gold mining are insignificant compared to the resulting damage to local environments and health concerns posed upon populations. For example, in 2014 the Madre de Dios region received around fourteen thousand US dollars (14K USD) in mining canon from over five hundred million dollars (500 M USD) of annual gold revenue. The Peruvian government would receive seventeen to seventy million dollars (17M to 70M USD) in tax revenue from these gold mining operations, but do not because mines are informal and evade taxes.

In Colombia ninety percent of gold mines are illegal. Low barriers to entry, such as accessible start-up costs and simplicity of operations incentivize more people to join the illegal activity. In Colombia, guerrilla groups have joined the mining business, using violence to mark their territory, defend their illegal mining and expand to new land.

According to the Carnegie Institution for Science, which carried out an assessment of Madre de Dios, illegal mining activity has led to soil erosion, and radical changes in river morphology which pose threats to the local ecosystem.

Peru's government has been trying a "carrot-and-stick" strategy to address illegal mining activity. In April they sent the army into Madre de Dios to confiscate and destroy mining equipment. They also moved to legalize some small-scale mines, granting permits so long as the mining takes place away from national parks and other protected areas. So far no single mine has

been formalized.

Peru is home to a lucrative illegal gold mining industry worth an estimated \$3 billion a year -- twice as much as the country's cocaine trade. In addition to passing a law banning all illegal mining in April 2014, the Peruvian government has tried a number of measures to clamp down on this illicit activity. Security forces have conducted raids on mining areas, destroying millions of dollars' worth of equipment, and demolished illegal gold refineries on the coast.

180,000 gallons of fuel reportedly enter the Madre de Dios region on a daily basis; an estimated 85 percent is used for illegal mining. It is estimated that close to 180,000 gallons of diesel and gasoline are used daily to run equipment for illegal mining only in Madre de Dios. This is equivalent to the daily fuel demand of 30 large divisions of the US Army and more than the daily fuel consumption for the entire metropolitan Lima area. Mining machinery requires 70 to 80 gallons of fuel per day, making fuel demand in Madre de Dios well above its population and development requirements. Due to this ludicrously high fuel demand, the Peruvian government has chosen Madre de Dios as a testing ground for the government's new fuel restrictions.

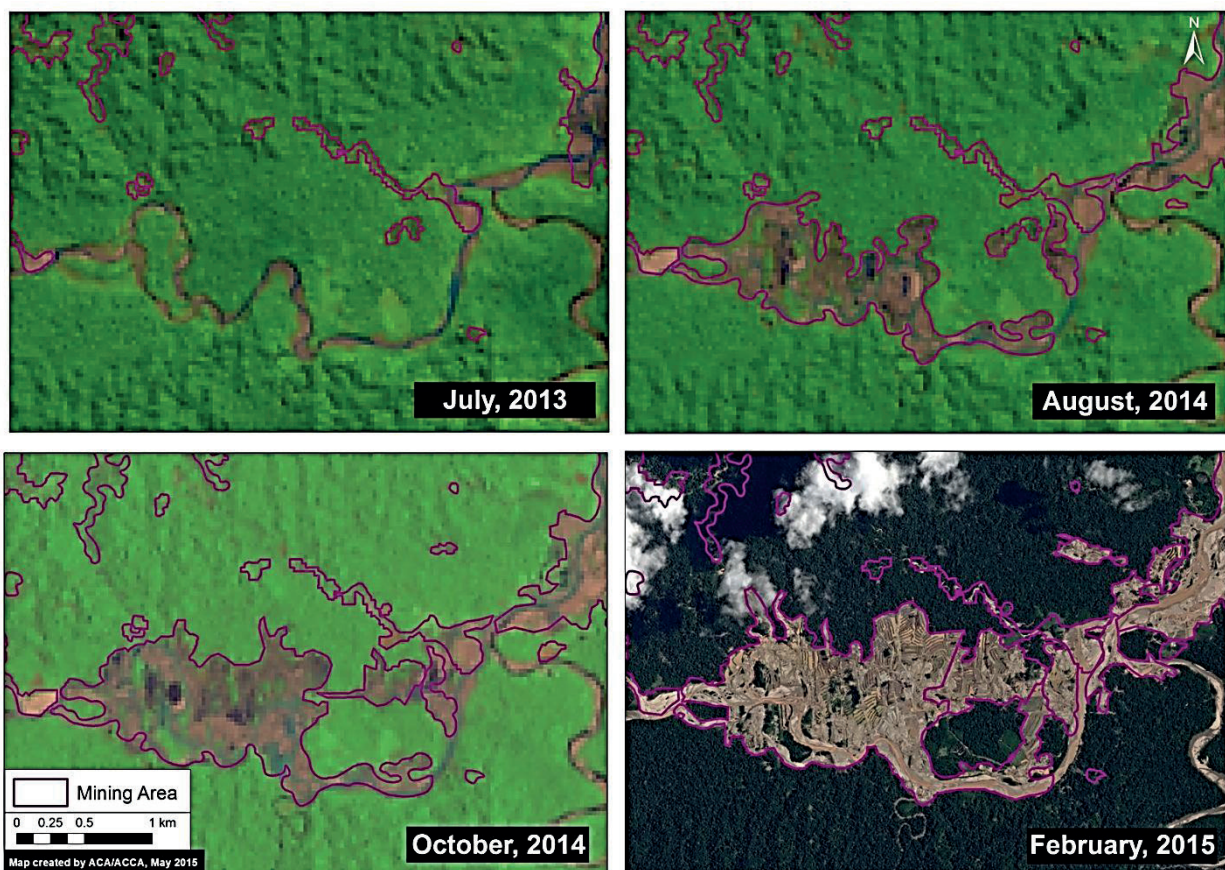
Specialized media outlets have recently deemed illegal mining as the "new cocaine" of Latin America in terms of illicit trading. Countries such as Colombia, Peru, Ecuador, Venezuela and Bolivia, are obtaining higher profits from the unlicensed activity than from drug trafficking; and the ecological damage is shocking.

Illegal mining in the Amazon jungle of Peru, mostly in Madre de Dios and Puno, is al-

ready generating 15% more profits⁴⁵ than the country's total estimated drug trafficking. The figure is alarming, as Peru is said to already be the world's largest exporter of cocaine.

An important initiative to track the impact of alluvial gold mining is the MAAP⁴⁶ Project. This project which is backed by the Amazon Conservation Association has done GIS and remote sensing analysis to assess the impact in Madre de Dios from pre-2000 to 2015. According to a PNAS⁴⁷ study by Greg Asner⁴⁸ et al. overall deforestation in the area is said to have reached approximately 50,000 ha as of 2012. This estimate does not include recent deforestation in La Pampa, which has occurred mostly from 2013 to 2015, and that according to the following satellite image⁴⁹ is growing quickly.

Fig. 5. Alluvial Gold Mining and 2013 - 2015 deforestation in La Pampa, Madre de Dios.



45 Chilean newspaper El Mercurio

46 <http://maaproject.org/en/>

47 <http://www.pnas.org/content/111/47/E5016.full.pdf?with-ds=yes>

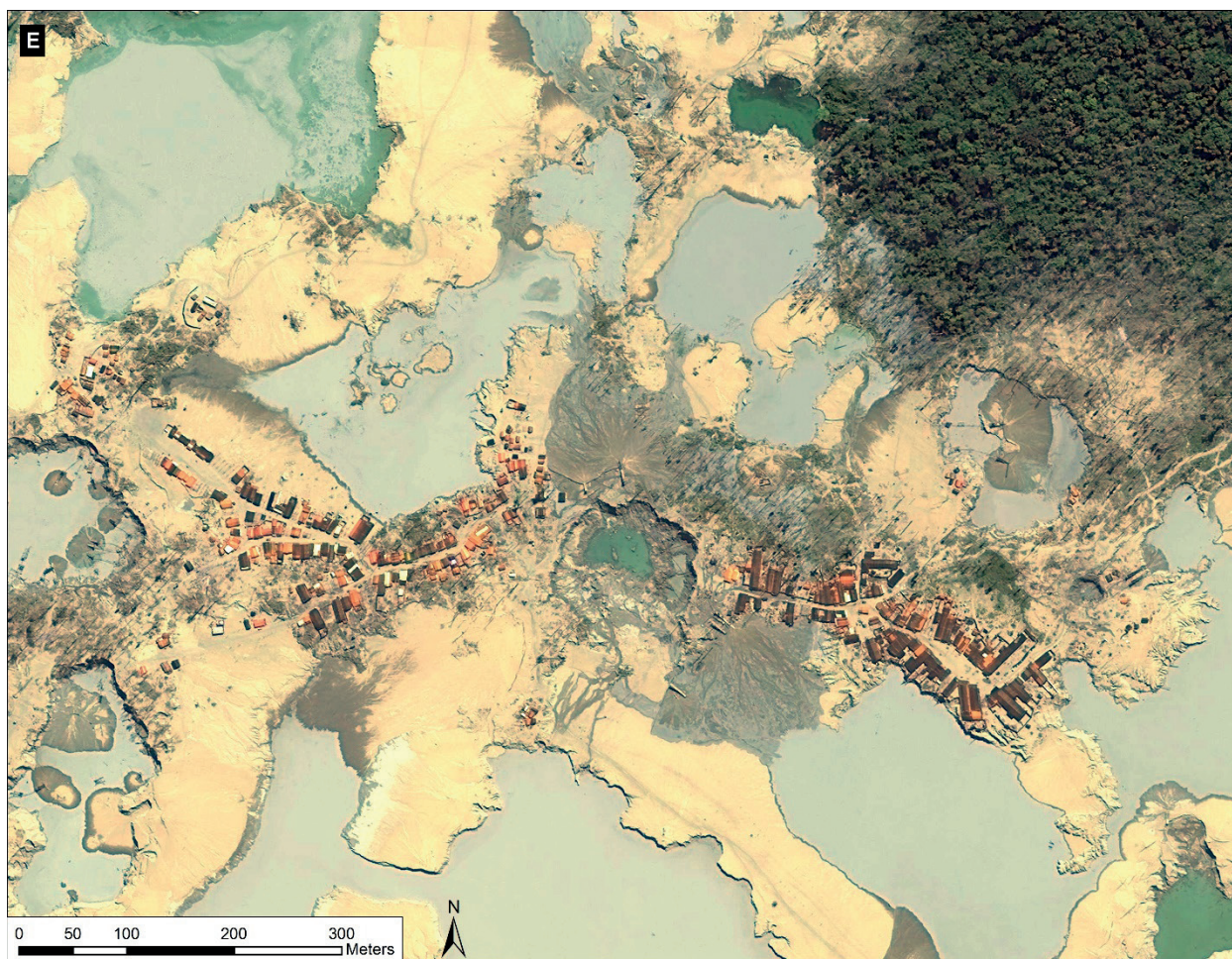
48 "Elevated rates of gold mining in the Amazon revealed through high-resolution monitoring", Gregory P. Asner et al published at PNAS, November 12, 2013, vol. 110, no. 46.

49 USGS, SPOT 7.

According to Lenin Valencia⁵⁰ from the Peruvian Society for Environmental Law (SPDA) there are no formal mines in Madre de Dios. Valencia states that while there are national efforts to limit environmental impact, they are of little help because they are enforced from 2000 km away with unsuccessful efforts to control land-use and restrict the mining of key areas such as Madre de Dios and Puno. Efforts to govern artisanal mining are held locally but need national support to implement policies.

Illegal mining in Madre de Dios is expanding into protected communal reserves and its impact goes far beyond deforestation. Illegal mining is not only causing loss of carbon stock, it is causing accelerated mercury pollution of water resources, human trafficking, soil loss and sedimentation of water habitats. The following image is a close up of an illegal mining site.

Fig. 6 Zoomed aerial photo of a deforested area with purification pools, exposed soils and gold mining infrastructure.



Source: WorldView2 from Digital Globe.

⁵⁰ Presentation on Informal Mining: convergences and divergences in the formalization process in Puno and Madre de Dios. SEPIA 2015 Conference, Arequipa August 2015.

The latest official report released by the Government of Peru reports that illicit gold extraction has led to violence, pollution of soils, rivers and the destruction of more than 50,000 hectares of natural rainforest reserves. This represents approximately 15 million tons of CO₂ plus big losses in biodiversity, water and natural environmental capital. The figure is significantly higher than the 18,000 ha that authorities reported last year. What is worse, is that illegal mining has triggered human trafficking and spread to surrounding countries such as Ecuador, Venezuela and Bolivia, which intensifies the damage to the Amazon forest, as well as water resources.

In Colombia the situation has is increasingly complex, with rebels and a new generation of drug gangs –known locally as “Bac-rims”– increasingly turning to gold mining to finance their terrorist activities. Mining and forestry are controlled by the FARC and other criminal gangs.

According to new official data released by the Environment and Sustainable Development Ministry of Colombia, close to 80% of all the gold produced in Colombia comes from a \$2.5 billion illicit mining industry. This parallel economy is harming the businesses of those who operate legally. It is reported that illicit miners are present in 233 Colombian municipalities, having caused the deforestation of 16,784 hectares (65 sq. miles) of primary forest and contaminated at least 19 rivers.

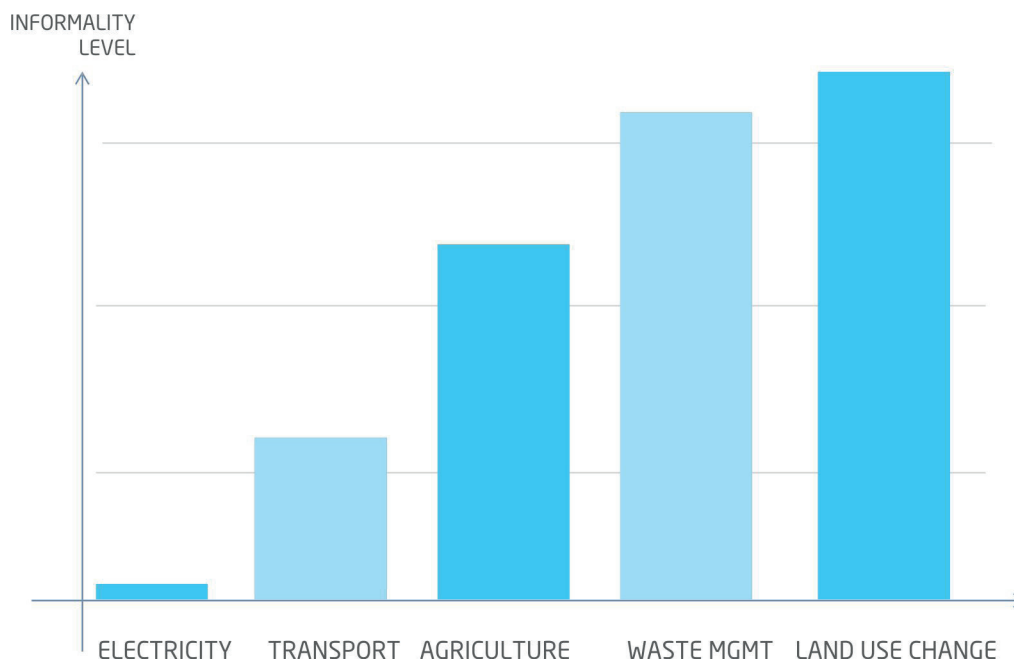
Informality barriers to implement Carbon Tax Instruments

The above highlighted cases are not the only types of activities affected by infor-

mality. We can find informality⁵¹ levels that challenge GHG management across many economic activities and emission categories of developing countries and emerging economies. Therefore an effective response to climate change should target the gradual participation and compliance of the informal economy within the process of revisiting INDCs to make them more ambitious and inclusive.

The high degree of informality observed in key emission categories seems to pose a challenge for the successful implementation of carbon tax instruments. This in turn affects countries’ capacities to account for and manage GHG emissions. Most countries develop their GHG inventories in a top down fashion reporting aggregate emissions. While this method may be useful to get an estimate of country emissions, concrete work to lower emissions in specific activities requires detailed emissions tracking to compare them with targets (e.g. iNDCs). Some of the source types are more prone to show informality than others. For example in most countries, grid connected electricity generation is very formal and the measuring is objective and detailed. This is not the case for agriculture, transport, waste management and AFOLU industries. **Figure 3** shows the frequent levels of informality shown by group of sources:

⁵¹ As a response to these challenges, a partnership has been formed by the Konrad Adenauer Foundation (KAS) and Programa de Inversión Responsable (PIR) to engage in the development of this discussion paper to kick start discussions on Informality and Climate Change.

Figure 3. Qualitative estimates of informality levels per GHG emission sources.

Due accounting of GHG emissions and improvement of governance and law enforcement capabilities are fundamental to implement instruments such as carbon taxes and Measurement, Reporting and Verification (MRV) systems. Michael Keen⁵² from the International Monetary Fund (IMF) underlines that “informality cannot form the basis of tax policy which instead should be structured as a function of societal priorities and the way businesses react to tax policies”. Under this school of thought, carbon taxes should not be discarded in areas with high level of informality; instead, their implementation should represent a milestone in a formalization path that seeks improvement of governance and law enforcement capabilities. This can trigger the development of competitive advantage for firms able to use their carbon efficiency to earn fiscal credits and enjoy the benefits of low emission economy.

Estimated scales of informality

Typically GHG Emission Inventories are organized into IPCC emissions categories. Informality may impact the accuracy, completeness and scale of each emission category. The authors of this paper have consulted GHG inventories experts on their perceived impact of informality on each emission category (these perceptions would need to be adjusted to each particular context):

⁵² Reducing Informality, Ravi Kanbur and Michael Keen. Finance and Development, March 2015 p. 52 – 54.

- **LOW impact:** It is estimated that over 96% of surveyed economic actors in the activity are duly registered, law abiding and pay taxes.
- **MEDIUM impact:** It is estimated that between 64 and 96% of surveyed economic actors in the activity are duly registered, law abiding, and pay taxes.
- **HIGH impact:** It is estimated that between 4 and 32% of surveyed economic actors in the activity are duly registered, law abiding and pay taxes.
- **VERY HIGH impact:** It is estimated that less than 4% of surveyed economic actors in the activity are duly registered, law abiding and pay taxes.

Table no. 1 highlights a sample of IPCC categories⁵³ that may have some degree of informality therefore affecting the completeness and effectiveness of data gathering, GHG emissions reporting, GHG emissions reductions governance and carbon tax collection for Pacific Alliance Countries.

53 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

Table No. 1: IPCC emissions category and gross estimated level of informality

IPCC Category code	IPCC Source name	GHGs	Estimated level of informality for Pacific Alliance Countries
1A2	Fuel Combustion Activities - Manufacturing Industries and Construction	CO ₂ , N ₂ O, CH ₄	Medium
1A3b	Fuel Combustion Activities - Transport - Road transportation	CO ₂ , N ₂ O, CH ₄	High
1A3d	Fuel Combustion Activities - Transport - Water-borne Navigation	CO ₂ , N ₂ O, CH ₄	High
3A1	Enteric Fermentation	CH ₄	Very high
3A2	Manure Management	CH ₄ , N ₂ O	Very high
3B1a	Forest Land Remaining Forest Land	CO ₂	Very high
3B1b	Land Converted to Forest Land	CO ₂	Very high
3B2b	Land Converted to Cropland	CO ₂	Very high
3C1	Biomass Burning	CH ₄ , N ₂ O	Very high
3C7	Rice Cultivations	CH ₄	High
4A	Solid Waste Disposal	CH ₄	High
4B	Biological Treatment of Solid Waste	CH ₄ , N ₂ O	High
4C	Incineration and Open Burning of Waste	CO ₂ , N ₂ O, CH ₄	Very high
4D	Wastewater Treatment and Discharge	CH ₄ , N ₂ O	Medium

KICK STARTING DISCUSSIONS

A discussion on the impact of informality on climate action can be approached through questions such as the following:

- I. **How does informality affect government’s capabilities to set a material baseline for climate action?** The atmosphere does not distinguish between emissions coming from formal or informal activities. Due accounting of all net emissions is critical in a world with a constrained carbon budget. A material baseline is essential to manage and track our progress of our response to climate change. This paper shows cases where informality impairs data availability of activity levels.
- II. **How does informality affect institutions’ and the private sector’s capacities to design and implement climate change measures?** Final success of climate change measures will depend on the governance aspects of implementers, business partners and regulators.
- III. **How does informality affect society’s capability to mobilize financing for its response to climate change?** Credit worthiness, counterparty risk and investor protection are commonly considered for allocating debt or equity. Informal implementers of GHG reduction measures will face barriers to access finance and even be part of the new low emission economy.
- IV. **How does informality affect institutions’ capabilities to enforce compliance with GHG targets?** A large share of GHG emissions for Pacific Alliance countries come from land use intensive activities. Considering the informality associated with land use practices in the region, compliance with any target will demand an immediate strengthening of the supervision and law enforcement capacities of governments.

Once a general discussion has been made, it could be useful to ask the same questions for specific cases. The following paragraphs provide a summary of the same questions and brief answers applied to specific informality cases:

Informality challenges for carbon tax instruments

- I. How does informality affect government’s capabilities to set a material baseline? Several IPCC categories show a medium to very high

level of informality in the examined countries. This poses challenges to estimating, tracking and reducing GHG emissions.

- II. How does informality affect institutions' and the private sector's capacities to design and implement climate change mitigation measures? Governments use policies to tailor direct impacts on the formal economy. The design and implementation of mitigation measures needs to factor-in policy and instruments that promote low emission activities. Unfortunately, the informal sector is excluded from the benefits of a new climate economy.
- III. How does informality affect society's capability to mobilize financing for its response to climate change? Revenues from carbon tax collection are limited to formal economic activities. This may affect the level of direct public resources available for financing low emission development.
- IV. How does informality affect institutions' capabilities to enforce compliance with GHG reduction targets? Formalization and governance strengthening is recommended before carbon tax is used for informal emissions sources.

Informality in the brick industry

- I. How does informality affect government's capabilities to set a material baseline? A large percentage of brick production occurs in an informal setting. This prevents the government from tracking and influencing the GHG emissions of informal brick producers.
- II. How does informality affect institutions' and the private sector's capacities to design and implement climate change mitigation measures? Government guaranteed mortgages and low emission bonuses are being considered to boost the delivery of low emission social housing. Informal brick makers would be automatically excluded from this benefit, hence limiting the positive impact of government and private sector efforts.
- III. How does informality affect society's capability to mobilize financing for its response to climate change? Informal brick makers are usually not eligible to receive concessional loans, commercial financing or equity investments. Besides receiving grant financing for some pilot activities, they are excluded from emerging sources of climate finance.
- IV. How does informality affect institutions' capabilities to enforce compliance with GHG targets? Informal brick makers do not exist in the

records of supervisory institutions; therefore institutions lack the mandate and resources to monitor and enforce compliance with GHG targets for brick production.

Informal Taxes

- I. How does informality affect government's capabilities to set a material baseline? Setting GHG baseline emissions in cities with high informality in the taxi service represents a challenge for local governments. Informal taxis are a hidden user of urban infrastructure and cities' carbon budget. They may represent up to 10% of total GHG emissions for urban transport.
- II. How does informality affect institutions' and the private sector's capacities to design and implement climate change mitigation measures? Mitigation measures for public transport are based on a sound management of transport options. Informal taxis constitute an available but unregulated transport option. Informal taxis may flourish due to institutional weaknesses and compete with formal private sector taxi services.
- III. How does informality affect society's capability to mobilize financing for its response to climate change? Access to finance is one of the main drivers for the formaliza-

tion of taxi cabs. Credit facilities to switch taxis from gasoline to natural gas have been very successful with formalization and financial inclusion.

- IV. How does informality affect institutions' capabilities to enforce compliance with GHG targets? Informal taxis do not exist in the records of local governments; therefore institutions lack the mandate and resources to monitor and enforce compliance with possible GHG targets. All they can do is to fine unauthorized taxis.

Alluvial Gold Mining

- I. How does informality affect government's capabilities to set a material baseline? The high mobility and informal nature of alluvial gold miners challenges the setting of a geospatial land use baseline.
- II. How does informality affect institutions' and the private sector's capacities to design and implement climate change mitigation measures? Illegal gold mining represents close to 10% of gold production in Peru and Colombia and challenges formal operations and protocols. Several formal and law abiding gold mining projects have been halted by agitators only to be later operated by informal miners causing big environmental and so-

- cial impacts.
 - III. How does informality affect society's capability to mobilize financing for its response to climate change? As gold prices skyrocket, government subsidies offered to formal gold mining, and other formal operations do not match the monetary incentive for illegal gold miners to continue doing business.
 - IV. How does informality affect institutions' capabilities to enforce compliance with GHG targets? Compliance with laws in alluvial gold mining sites is challenging and limited to decommissioning equipment. Given the atomized and concealed nature of their activities, informal miners can quickly be back in business.
- ii. Informality impairs society's ability to manage its response to climate change.
 - iii. Preliminary results show that the informal economy is a hidden user of the carbon budget.

Informality will prevail should countries fail to include the citizen as an agent of the State. To avoid this, our recommendation is to amend existing tax frameworks to incentivize citizens to document their tax deductible expenditures and optimize their tax exposure.

The following postures may help to launch a debate on informality and climate change:

- i. Although some rules and regulations are far from being optimized and can inhibit business development, much of the legal framework has been developed to safeguard the common wellbeing of citizens. In this way, the impact of informality goes far beyond the mere evasion of taxes and non-conformity with permits and licenses. Informality can prevent alignment of business practices with public policies including those devised for climate change action.

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