Annex: Data Analysis

In completing the working paper, "Corruption in the Land Sector", various correlations were tested to better understand the interconnection among corruption, governance, land and development. This analysis was done using existing data from Transparency International and other global data sets. For TI, the Corruption Perceptions Index (CPI) was used as well as specific data on corruption and land that was extracted from the results of the Global Corruption Barometer (2009). For the other areas, the data sources looked at national income, human development, crop yields and foreign direct investment (FDI). The sections that follow explain the data sources, results and preliminary conclusions.

1. Data

GCB: Global Corruption Barometer 2009– The 2009 Global Corruption Barometer (GCB) surveyed a nationally representative sample of more than 1000 people in each of the 69[1] countries included in the study. The surveys were conducted between October 2008 and February 2009 by Gallup International (and their affiliates) on behalf of Transparency International.

The survey asked two questions relating to corruption in land management These questions were funded by the Food and Agriculture Organization (FAO) of the UN and developed in collaboration with international experts on the topic. Responses were scored on a scale from 1 to 5.

Now we have a set of questions on corruption in land management.

Q10.A. Using a scale of 1 to 5, where 1 means not a problem at all and 5 means a very serious problem

How serious do you think is in this country the problem of bribes being paid to land authorities to obtain favourable decisions in selling, buying, leasing, inheriting and registering land, or in land tax declaration, or in handling land disputes?

Not a problem at all				Very serious problem	Don't know/ not applicable
1	2	3	4	5	9

Q10.B. How serious do you think the problem of grand or political corruption in land matters is in this country?
(Optional definition of Grand or Political Corruption in land management refers to corruption in the privatisation of state-owned land, zoning or construction plans assigned without technical support, and/or land being expropriated (compulsory purchase) without appropriate or any compensation for actual land value.)

Not a problem at all				Very serious problem	Don't know/ not applicable
1	2	3	4	5	9

Answers given as "Don't know/Not applicable" were excluded from the calculations. The scale from 1-5 was then averaged across the population in each country, to calculate the average perception of corruption in land management in a given country, as relating to the two separate questions above (10.A and 10.B).

CPI: Corruption Perceptions Index 2009 – The CPI is an index produced annually by Transparency International, which scores and ranks countries on the perceived levels of corruption in that country. For this analysis we used the 2009 data to be consistent with the GCB results. In 2009 the CPI scored and ranked

180 countries on a scale of 0-10, with scores ranging from 1.2 (highest perceived corruption) to 9.7 (lowest perceived corruption).[2]

GDP: Gross Domestic Product per capita – This data comes from the United Nations Development Programme (UNDP) and provides the GDP per capita, given in Purchasing Power Parity (PPP) terms, for 2009. The data covers 174 countries from US\$ 520 (Sierra Leone) to US\$ 61,000 (Luxembourg).[3]

HDI: Human Development Index 2009 – The HDI is an index produced annually by the UN Development Programme (UNDP). This index combines data on life expectancy, educational attainment and income to score and rank countries. For this analysis we used the 2009 data to be consistent with the GCB results. In 2009 the HDI scored 175 countries on a scale of 0-1, with scores ranging from 0.27 (least developed) to 0.96 (most developed).[4]

Crop: Cereal yield 2009 – This data comes from the Food and Agriculture Organisation of the United Nations. The data measure the average kilogram (kg) of cereal output per hectare of farmland. The data covers 182 countries and ranges from 2,236 (Cape Verde) to 97,107 (Belgium).[5]

INV: Investment as a share of GDP 2007 – This data uses the Penn World Tables data for the share of investment as a percentage of GDP. The range of data is between -7 per cent (Sierra Leone) and 78 per cent (Suriname).[6]

2. Results

Drawing on the data, various relationships were tested. Each of these is described below, including the number of observations and the strength of the correlation.

1. Relationship between petty and grand corruption in land

Finding: We find a strong correlation between petty corruption in land (Q.10.A from the GCB) and grand corruption in land (Q.10.B from the GCB).

Correlation coefficient = 0.95 (p<0.01)

Number of observations = 69

2. Relationship between corruption in land and overall corruption perceptions in the public sector:

Finding: Both of the GCB measures for corruption in land correlate very strongly and negatively with the CPI measure of corruption perceptions for the public sector in general. This demonstrates that more corruption in land is associated with a lower CPI score (higher perceived public sector corruption)

For petty corruption: correlation coefficient is -0.69 (p<0.01)

For grand corruption: correlation coefficient is -0.73 (p<0.01)

Number of observations = 68

3. Relationship between corruption in land and income:

Findings: Both of the GCB measures for corruption in land correlate strongly and negatively with the GDP measure for income per capita. This demonstrates a negative relationship between higher levels of corruption in land and lower GDP per capita.

For petty corruption: correlation coefficient is -0.60 (p<0.01)

For grand corruption: correlation coefficient is -0.62 (p<0.01)

Number of observations = 64

4. Relationship between corruption in land and human development:

Findings: Both of the GCB measures for corruption in land correlate negatively with the HDI measure for human development, demonstrating a relationship for countries between high corruption in land and lower development outcomes.

For petty corruption: correlation coefficient is 0.47 (p<0.01)

For grand corruption: correlation coefficient is 0.47 (p<0.01)

Number of observations = 64

However this relationship becomes insignificant in regressions which control for income (GDP), suggesting that the relationship is working through the income variable.

5. Relationship between corruption in land and agricultural production:

Findings: Both of the GCB measures for corruption in land correlate strongly with the crop measure for crop yield (cereals). This demonstrates a negative relationship between countries where corruption in land is higher and crop yields are lower.

For petty corruption: correlation coefficient is 0.47 (p<0.01)

For grand corruption: correlation coefficient is 0.47 (p<0.01)

Number of observations = 61

However this relationship becomes insignificant in regressions which control for income (GDP), suggesting that the relationship is also working through the income variable.

6. Relationship between corruption in land and investment:

Findings: Both of the GCB measures for corruption in land correlate strongly and negatively with the measure for foreign direct investment, demonstrating a relationship between countries where corruption in land is higher and investment is lower.

For petty corruption: correlation coefficient is 0.46 (p<0.01)

For grand corruption: correlation coefficient is 0.42 (p<0.01)

Number of observations = 67

However this relationship becomes insignificant in regressions which control for income (GDP), suggesting that the relationship is also working through the income variable.

3. Conclusions

The findings underscore the negative role that corruption in land plays in terms of country's development and growth. There are clear, strong and negative relationships between perceived higher levels of corruption in land and lower growth, investment, development and agricultural output. However, the strong force exerted by income in these equations suggests that further analysis would be useful to better understand the nature of these relationships and additional factors at play (such as inequality) that could be conditioning these results.

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[1] For full country coverage of the Global Corruption barometer 2009 see
http://www.transparency.org/content/download/43788/701097
[2] Data on the CPI can be accessed at:
http://www.transparency.org/policy_research/surveys_indices/cpi.
[3] Figures for GDP can be found at: http://hdrstats.undp.org/en/indicators/62006.html.
[4] Data from the HDI can be found at: http://hdr.undp.org/en/statistics/.
[5] For figures, please see: http://faostat.fao.org/site/339/default.aspx.
[6] For figures, please see: http://pwt.econ.upenn.edu/php_site/pwt_index.php.