

# An Assessment of the Accuracies of Preliminary Index Diagrams (PIDs) as Used in Land Registration in Kenya



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Master's Thesis  
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## Introduction

Current trend is towards improvement of rural agriculture and rural life. Most of Kenya is rural land under general boundaries system. The PIDs used in these areas have been noted to have errors inherent in the aerial photographs from which they were prepared. This makes them unsuitable for more accurate cadastral surveys. This inaccuracy should be improved or alternative method adopted.



Photogrammetric plotting

## Methodology

The approach adopted involved parcel-measurement by a handheld GPS. Photogrammetric plotting of the land parcels by a Stereo-plotter was also undertaken. GPS areas, registered areas and Machine Plot areas were then compared. Statistical analysis (T-Test) was carried out to determine whether the differences were significant. The current land registration system was also reviewed.



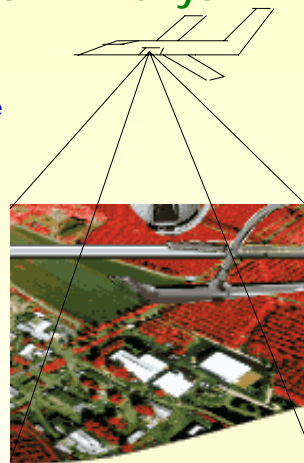
Positioning by a handheld GPS

## Findings

A significant difference in the Land Registry and GPS measurements was noted. Parcels of land furthest from the principal point of the taking camera were severely distorted. The PIDs showed parcels as topologically positioned; topographically, these parcels were displaced from their true geometric positions.

## Conclusion

The information on the PIDs does not reflect the ground situation. Consequently, their continued use for mutation surveys, planning, etc jeopardizes cadastral surveys in the country. In the event of dispute settlement PIDs should therefore be treated with extreme caution.

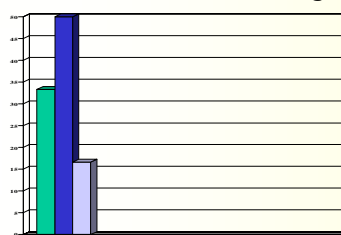


Large-scale mapping

## Theory and Premise

The success of a cadastral system to a large extent depends on the quality of mapping and the level of involvement of the landowners. In most developing countries, cadastral systems are poorly developed.

## Landowners' need to register land



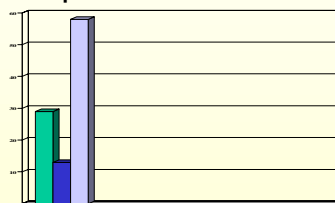
### Key

- Understand fully (33.3%)
- Partially (50.0%)
- Very little (16.7%)

## Sample result 1: Parcel areas

Parcel no.	GPS area	Reg. area	Difference	% age diff.
12	4.43 Ha	3.60 Ha	0.83 Ha	18.74
71	2.74 Ha	2.20 Ha	0.54 Ha	19.71
67	1.73 Ha	1.40 Ha	0.33 Ha	19.08
61	5.44 Ha	4.60 Ha	0.84 Ha	15.44
69	1.96 Ha	1.60 Ha	0.36 Ha	18.37

## Sample result 2: Parcel distortion



### Key

- Severely distorted: 29%
- Moderately distorted: 13%
- Least distorted: 58%

## The Way Forward

Since 're-fly' is expensive, survey regulations should be revised to accommodate alternative technologies to improve cadastral surveys. The 'push-button' (GPS) technology requires relatively low-skilled personnel who can abundantly be trained. There is an urgent need for management training programmes for the staff.