

ISO 19152 is at Stage of Final Draft International Standard

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1. INTRODUCTION

The development of LADM to an International Standard is an initiative of FIG. This standardisation is a comprehensive, extensive, formal process with a continuous review and a continuous, creative approach to find common denominators in land administration systems and included data sets. FIG submitted the LADM as a New Work Item Proposal to ISO/TC 211 in 2008.

The Final Draft International Standard (FDIS) covers basic information related to components of land administration (including water and elements above and below the earth surface). It includes agreements on data about administrative and spatial units, land rights in a broad sense and source documents (e.g. deeds or surveys). The rights may include real and personal, informal rights as well as indigenous, customary and informal rights. All types of restrictions and responsibilities can be represented. Overlapping claims to land may be included. The draft standard can be extended and adapted to local situations; in this way all *people land relationships* may be represented. This can be supportive in the development of software applications built on database technology.

LADM describes the data contents of land administration in general, based on a practical approach. The roots are in FIG's Cadastre 2014 ([Kaufmann and Steudler, 1998](#)).

Implementation of LADM can be performed in a flexible way; the standard can be extended and adapted to local situations. External links to other data bases, e.g. addresses, are included. Legal implications that interfere with (national) land administration laws *are outside the scope of the LADM*.

The LADM has been designed and validated in an *incremental approach*. Initial versions in different stages have been discussed during several FIG and other events.

2. WHERE ARE WE NOW?

In 2010 the LADM has been published as a Draft International Standard (DIS) by the ISO ([ISO, 2011](#)), as ISO 19152.

Participating Members of ISO/TC 211, Geographic Information, did comment on the DIS and brought their votes on continuation of the development of LADM. The result of this voting round was positive.

Earlier voting rounds resulted also in positive support, see table 1.

It is clear from this table that support for LADM is growing. The DIS was approved with only two negative votes³³. This means that the LADM is in the stage of Final Draft International Standard now. The Editor will process the received comments and observations into an updated draft. This updated draft will be discussed with the Editing Committee. Then further comments and observations will be processed before the updated draft will be sent to ISO for publication on 7 November 2011. This publication is related to *final voting*. If the result of final voting is positive the International Standard will be published in 2012, about 4 years after the approval of the New Working Item Proposal. This would be a mile stone for FIG.

Voting ISO 19152	New Working Item Proposal (NWIP) 2 May 2008	Committee Draft (CD) 12 October 2009	Draft International Standard (DIS) 27 June 2011
Approve	15	22	26
Disapprove	6	3	2
Abstain	4	4	4
Not Voted	7	3	0

Table 1: LADM Voting results

LADM can be a shared basis for data from different Land Administration Systems. The Draft International Standard includes informative example cases with people and land relationships demonstrating the flexibility of the draft standard. Further, the relationships with the INSPIRE (Infrastructure for Spatial Information in the European Community, (INSPIRE, 2009)) Cadastral Parcels model and LPIS (Land Parcel Identification Systems – this is a part of the Integrated Administration and Control System established by the European Union Member states) are described in annexes. 3D Cadastres are covered in such a way that these seamlessly integrate with existing 2D registrations.

3. PACKAGES OF THE LADM IN THE DRAFT INTERNATIONAL STANDARD

LADM, as a product, is a conceptual schema. LADM is organized into three packages, and one subpackage. (Sub)packages facilitate the maintenance of different data sets by different organizations, e.g. Land Registry or Cadastre (each with their own responsibilities in data maintenance), operating at national, regional or local level.

The three packages are: Party Package, Administrative Package and Spatial Unit Package. The Surveying and Spatial Representation Subpackage is one subpackage of the Spatial Unit package.

4. IMPLEMENTATION AND USE IN PRACTICE

When the LADM is finalised as an International Standard it can be used for as a basis for the design of Land Administration Systems. Modelling facilitates appropriate system development (and reengineering) and, in addition, it forms the basis for communication between different systems in different (parts of) organisations. This use of LADM in practice means that now, finally, application design can be based on GIS and database technology. Of course there is no difference if open source or commercial GIS and/or Database Management platforms are

³³ This project is parallel with CEN, and there LADM was approved with one negative vote as a Draft International Standard.

used for this purpose. When using standards, information can be exchanged in heterogeneous (commercial and open source) and distributed environments. Several country profiles have been created (some of them included in an annex of the draft standard) and other model use is being conducted e.g. the Land Parcel Identification Systems or the Social Tenure Domain Model (Augustinus, et al 2006, FIG 2010). A part of the LADM SpatialUnit Package has been used in the INSPIRE Data Specification on Cadastral Parcels. The idea is that LADM will be fully integrated in this specification after its acceptance.

The FAO Solutions for Open Land Administration (SOLA) project will promote affordable IT-systems that enable improvements in transparency and equity of governance. Started in June 2010, SOLA is a three year trust fund project, funded by the Government of Finland. Through the development and re-use of open source software, it aims to make computerised cadastre and registration systems more affordable and more sustainable in developing countries. Three countries (Samoa, Nepal and Ghana) have been identified for pilot implementation of the software. The LADM is being used as input for SOLA developments; see www.flossola.org.

5. CONCLUDING REMARKS

A first step in the direction of domain modeling of LA has been made with LADM. Data needed for Land Administration in a broad sense can be represented in the LADM. There will be a next voting round within ISO on the further development of LADM. But in some countries, country profiles are already under development. It is expected that there will be a future need for the development of other non-LA domains. Within LADM these non-LA domains are explicitly indicated as external classes, such as persons (parties)³⁴, addresses, valuation, taxation, land use, coverage, physical utility networks, etc. Within the European Union, some of these domains are treated in INSPIRE, but certainly not all. Here lies an important role for FIG at a global scale (and in relationship with ISO).

The requirements from future land governance stem from improving registration of public restrictions, registration of public benefits, registration practices with regard to public land, registration of 'public goods' and its spatial extents and policy implications. In the past, there have been more publications on the anticipated developments of Land Administration, see (Van der Molen, 2003) and more recently (Bennett et al, 2010; Lemmens, 2010a; Lemmens, 2010b). The expected further requirements for the next decade are support of: mature information infrastructures to serve society; dynamic process models with updating/participation by actors; 3D, 4D and 5D that is, space, time and scale integrated in Land Administration; spatial design applications; new rights, restrictions and responsibilities; international semantic web-based seamless registration; monitoring applications and community driven cadastral mapping. LADM can bring support here from a modeling perspective.

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³⁴ Party may be an external class in LADM, this may relate to population register or company register. If this can not be implemented as external class it can be a LADM class. The same is valid for other external classes as mentioned in LADM.

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BIOGRAPHICAL NOTES

Christiaan Lemmen holds a degree in geodesy from Delft University of Technology, The Netherlands. He is director of the FIG International Bureau of Land Records and Cadastre OICRF. He is an assistant professor at the Faculty of Geo-Information Science and Earth Observation (ITC), University of Twente, and an international consultant at Kadaster International. He is chair of the Working Group 7.1 'Pro Poor Land Management' of FIG Commission 7, 'Cadastre and Land Management', and contributing editor of GIM International.

Peter van Oosterom obtained an MSc in Technical Computer Science in 1985 from Delft University of Technology, The Netherlands. In 1990 he received a PhD from Leiden University for this thesis 'Reactive Data Structures for GIS'. From 1985 until 1995 he worked at the TNO-FEL laboratory in The Hague, The Netherlands as a computer scientist. From 1995 until 2000 he was senior information manager at the Dutch Cadastre. Since 2000, he is professor at the Delft University of Technology (OTB institute) and head of the section 'GIS Technology'. He is the current chair of the FIG joint commission 3 and 7 working group on '3D-Cadastres' (2010-2014).

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