

Crossborder Interoperability of Land-Use Information

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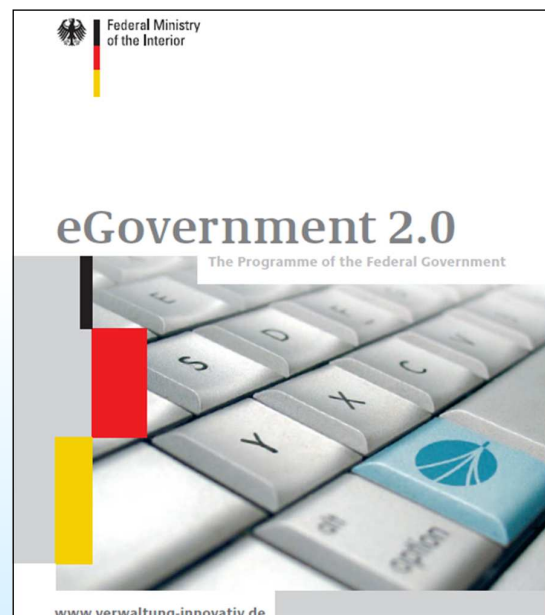
*Technical Session TS03H
Geospatial Techniques/Algorithms 3: 18 June, 11:30–13:00*



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Topics of Presentation

1. Introduction
2. European Spatial Data Infrastructure (INSPIRE) and Interoperability Levels
3. E-Government 2.0 in Germany
4. The Case Study of Interoperability
5. Conclusion

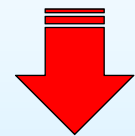


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Classification of SDI hierarchy levels

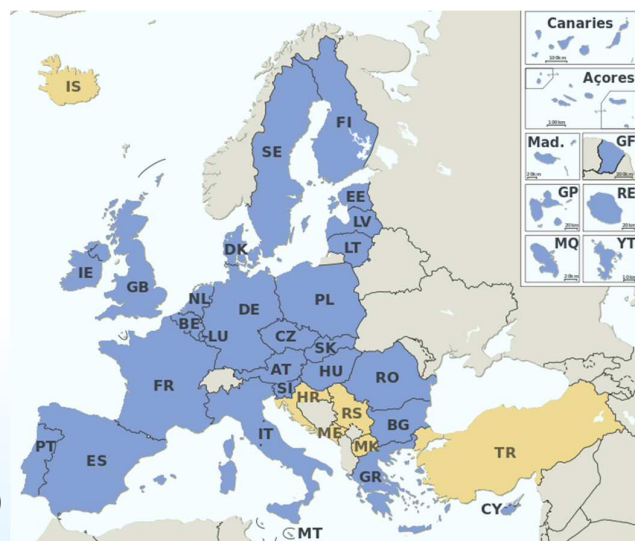
Source: Rajabifard et al (1999)

- Global Spatial Data Infrastructure (GSDI)
- Regional Spatial Data Infrastructure (RSDI)
 - Ex. INSPIRE
- National Spatial Data Infrastructure (NSDI)
 - Ex. SDI Germany
- State or Provincial Spatial Data Infrastructure (SSDI)
- Local Spatial Data Infrastructure (LSDI)
 - Ex. SDI German State of Rheinland-Pfalz
- Corporate Spatial Data Infrastructure (CSDI)



Interoperability ?

Regional Spatial Data Infrastructure (RSDI)



EU INSPIRE Directive

1. came into force on 15 May 2007
2. full implementation required by 2020
3. aims to create a European Union (EU) spatial data infrastructure → sharing of environmental spatial information among public sector organisations and better facilitate public access to spatial information across Europe

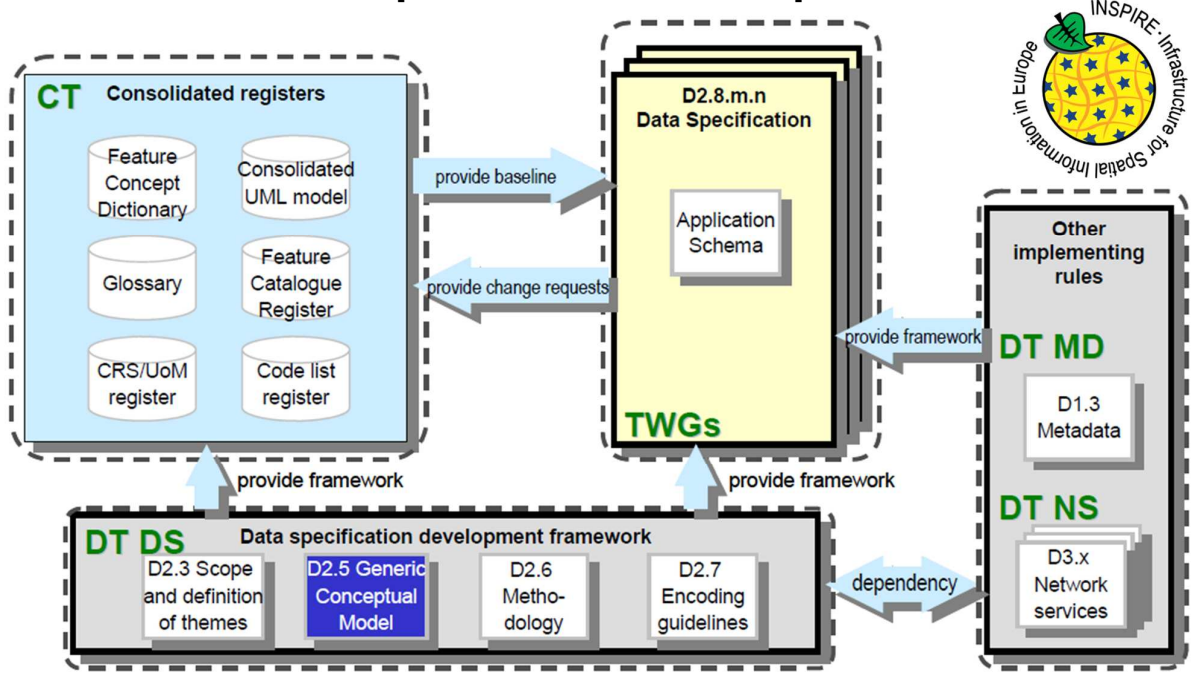


34 INSPIRE Themes

Annex I 1. Coordinate reference systems 2. Geographical grid systems 3. Geographical names 4. Administrative units 5. Addresses 6. Cadastral parcels 7. Transport networks 8. Hydrography 9. Protected sites	Annex III 1. Statistical units 2. Buildings 3. Soil 4. Land use 5. Human health and safety 6. Utility and governmental services 7. Environmental monitoring facilities 8. Production and industrial facilities 9. Agricultural and aquaculture facilities 10. Population distribution – demography	11. Area management/ restriction/regulation zones & reporting units 12. Natural risk zones 13. Atmospheric conditions 14. Meteorological geographical features 15. Oceanographic geographical features 16. Sea regions 17. Bio-geographical regions 18. Habitats and biotopes 19. Species distribution 20. Energy Resources 21. Mineral resources
Annex II 1. Elevation 2. Land cover 3. Ortho-imagery 4. Geology		

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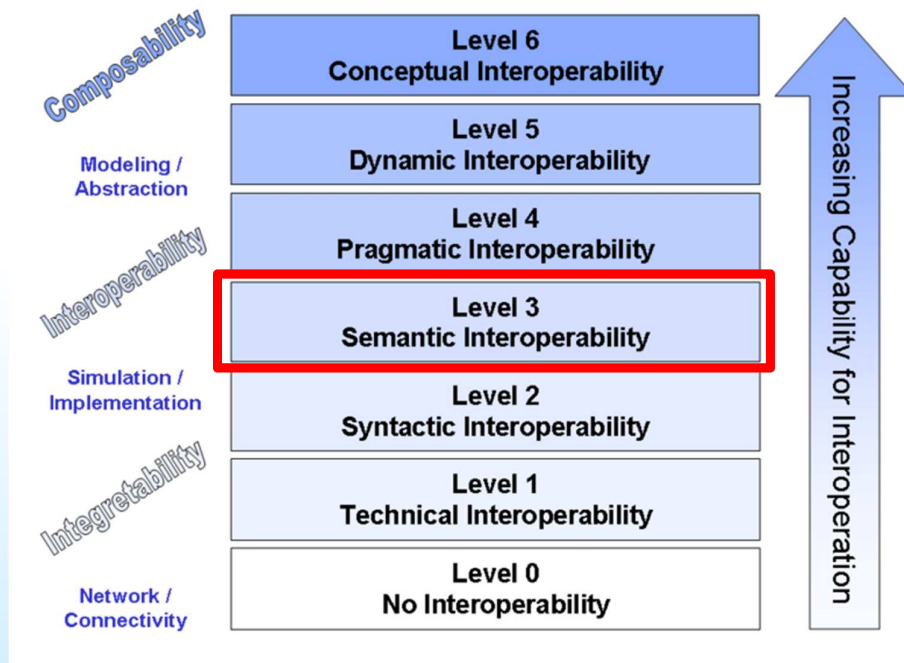
The INSPIRE Data specification development framework



http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/D2.7_v3.3rc2.pdf

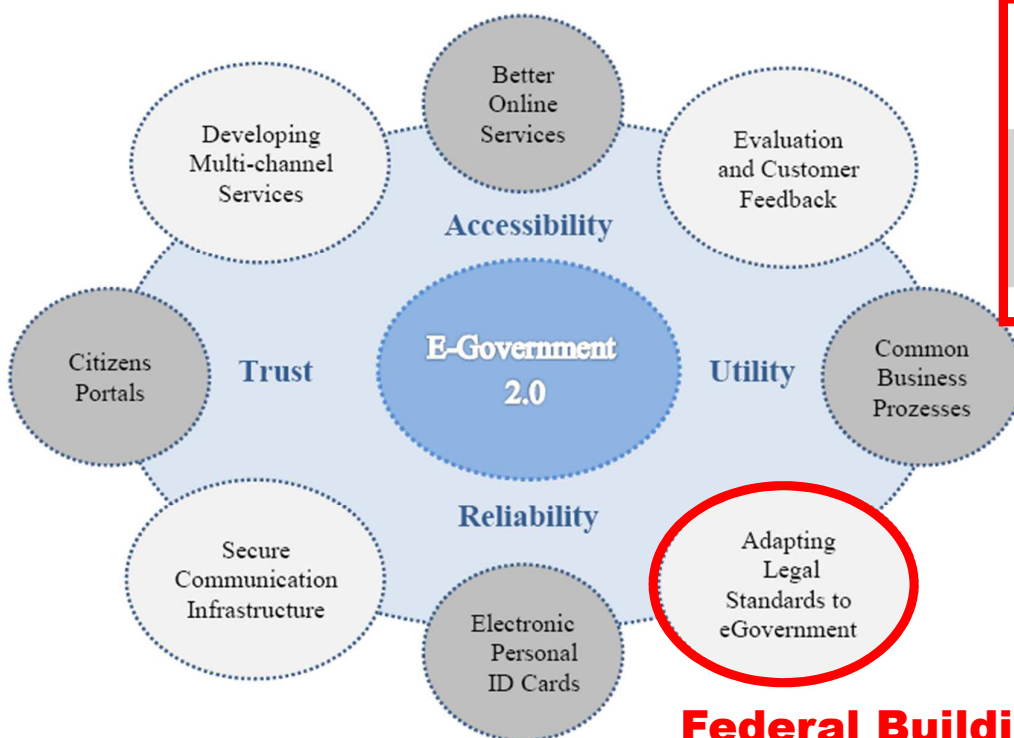
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Levels of Interoperability (Wang et al, 2009)



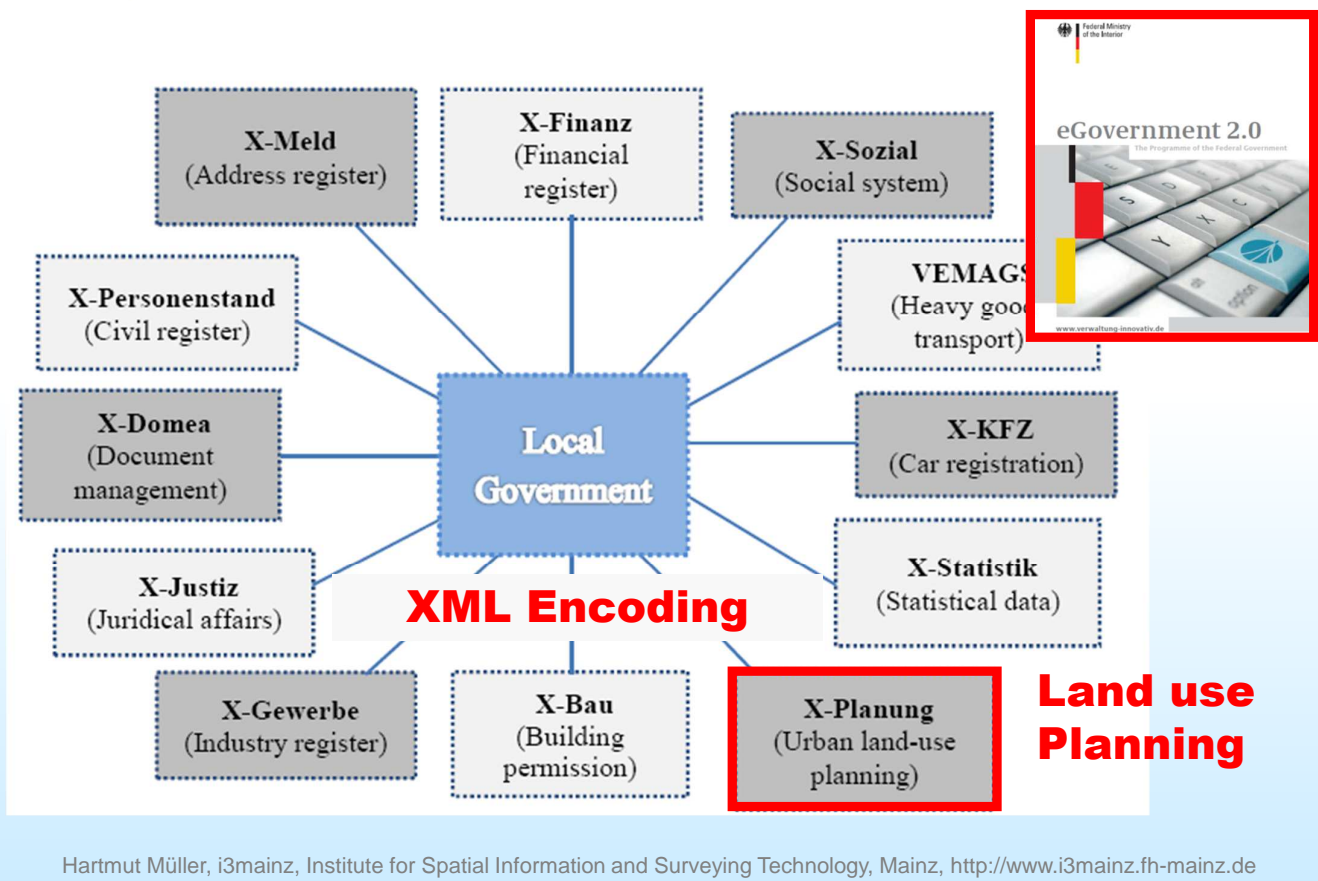
Source: Wang W.G., Tolk A., Wang W.P., (2009)

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Federal Building Code (Baugesetzbuch, BauGB)

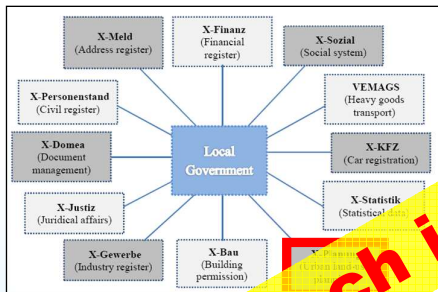
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National eGovernment Data



INSPIRE Data

Annex I 1. Coordinate reference systems 2. Geographical grid systems 3. Geographical names 4. Administrative boundaries 5. Addressing systems 6. Administrative boundaries 7. Administrative boundaries 8. Administrative boundaries 9. Administrative boundaries 10. Administrative boundaries 11. Administrative boundaries 12. Administrative boundaries 13. Administrative boundaries 14. Administrative boundaries 15. Administrative boundaries 16. Administrative boundaries 17. Administrative boundaries 18. Administrative boundaries 19. Administrative boundaries 20. Administrative boundaries 21. Administrative boundaries	Annex II 1. Elevation 2. Land cover 3. Ortho-imagery 4. Geology	Annex III 1. Area management/restriction/regulation zones & reporting units 2. Natural risk zones 3. Atmospheric conditions 4. Meteorological geographical features 5. Oceanographic geographical features 6. Sea regions 7. Bio-geographical regions 8. Habitats and biotopes 9. Species distribution 10. Energy Resources 11. Mineral resources
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How to reach interoperability ???

Case Study of Interoperability Planned Land-Use

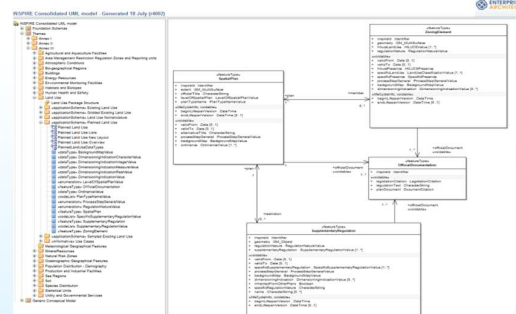
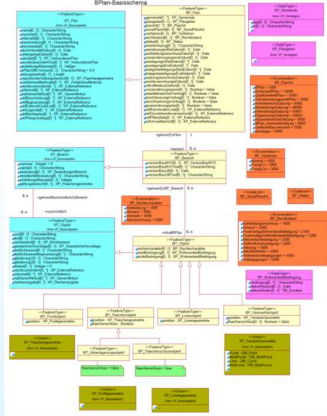
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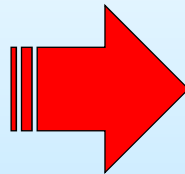
Source Data Model

Target Data Model

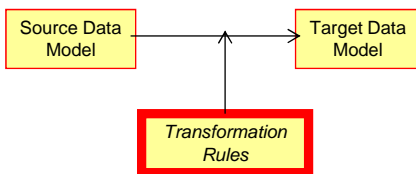
Transformation Rules



XPlanGML

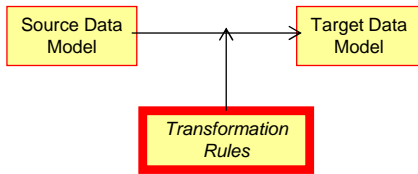


INSPIRE



Transformation Rules (Extract 1)

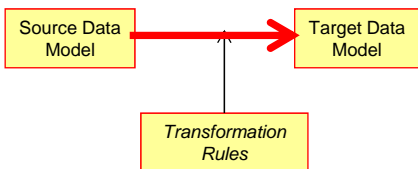
XPlanGML		INSPIRE - ZoningElement
Attribute Value	Zoning	HILUCS Value
LandwirtschaftAllgemein	true	1_1_agriculture
Ackerbau	true	1_1_1_CommercialAgricultureProduction
WiesenWeidewirtschaft	true	1_1_1_CommercialAgricultureProduction
GartenbaulicheErzeugung	true	1_1_1_CommercialAgricultureProduction
Obstbau	true	1_1_1_CommercialAgricultureProduction
Weinbau	true	1_1_1_CommercialAgricultureProduction
Imkerei	true	1_1_1_CommercialAgricultureProduction
Binnenfischerei	true	1_4_2_ProfessionalFishing



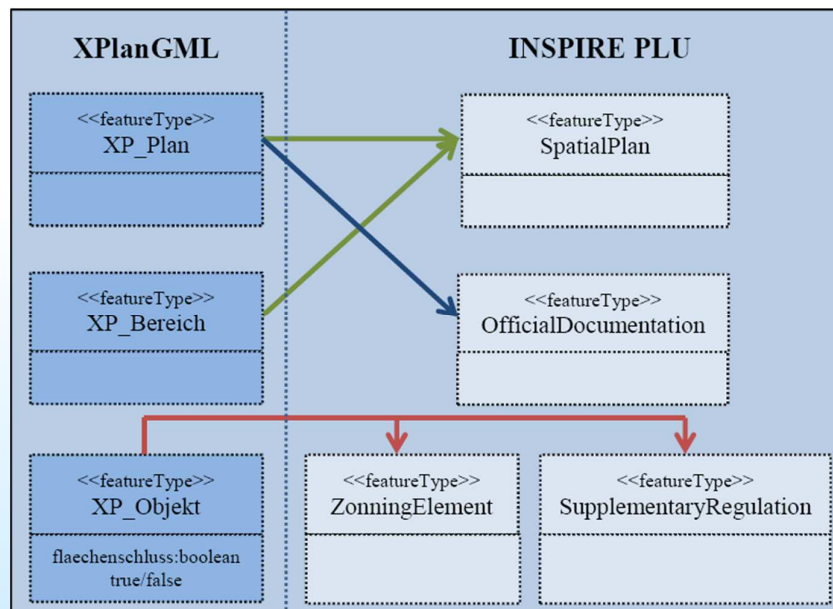
Transformation Rules (Extract 2)

XPlanGML	INSPIRE – Supplementary Regulation	
Attribute Value	Zoning	Supplementary Regulation Value
HochwasserRueckhaltebecken	false	2_RiskExposure
Ueberschwemmungsgebiet	false	2_1_FloodRisk
Versickerungsflaeche	false	2_RiskExposure
Entwaesserungsgraben	false	2_RiskExposure
Sonstiges	false	2_RiskExposure

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Relations between XPlanGML and INSPIRE PLU Feature Types



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Graphic Representation

HILUCS level 2	colour	red	Green	blue
1_PrimaryProduction	"yellow-green"	180	230	110
1_1_AgriculturalUse	"yellow"	230	230	110
1_2_Forest	"green"	140	280	110
2_SecondaryProduction	"dark grey"	100	100	100
3_TertiaryProduction	"grey"	150	150	150
4_TransportNetworkLogisticsAndUtilities	"purple"	180	120	240
4_1_4_WaterTraffic	"blue"	140	120	240
	"purple"			
5_ResidentialAreasWithOtherCompatibleUse	"red"	240	120	100
6_OtherUses	"off-white"	220	220	220
6_3_1_LandAreasInNaturalUse	"green off-white"	200	255	200
6_3_2_WaterAreasInNaturalUse	"blue off-white"	200	200	255

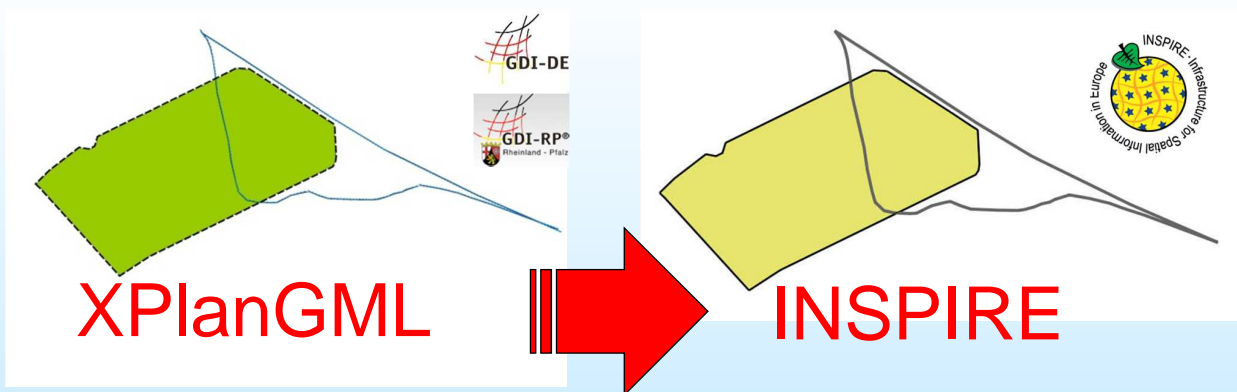
12. Flächen für die Landwirtschaft und Wald
 (§ 5 Abs.2 Nr. 9 und Abs. 4, § 9 Abs.1 Nr. 18 und Abs. 6 BauGB)

12.1 Flächen für die Landwirtschaft



PlanzVO 90, Germany

INSPIRE Presentation Rules



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Creating INSPIRE compliant Metadata

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Conclusions

- **Land-use** covers only a small piece of European spatial information, but the overall INSPIRE regulations have reached the level of technical implementation
- **Semantic interoperability** in principle can be reached at the level of feature types, attributes and relationships
- The **municipalities** takes a practical benefit to transfer the output data set in XPlanGML automatically to the INSPIRE classification with predefined Transformation Service
- It can be stated that the **technical and semantic provision** of digital development plans with XPlanGML also supports fulfilling the **legal requirements of INSPIRE** in Germany

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Thank you for your attention!

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