new type into the soil family to distinguish artificial soils from natural ones. This proposed scheme for soil classification is believed to be able to reflect effects of human activities varying in type on soil, which fills a gap by a certain degree in the study on classification of this type of soils.
**Keywords:** Soil taxonomy; Artifacts; China
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**(5977 - 2165) Are Geographic Information Systems and Remote Sensing Technologies Enough tools for improving landuse planning? A case study of Arnaha VDC of Saptari District, Nepal**

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A detailed soil survey was carried out in Arnaha village area (1000 ha) of Saptari District, Nepal in early 2017 to evaluate and improve rural land uses for micro-level planning and productivity. RS and GIS techniques were used to create the baseline data. DTM was used to delineate the boundaries of land units. These were assigned to different land systems, and boundaries defined ased on position, slope, direction, drainage of landscape features which are especially important for local level project designing. Seven types of land system units (1a to 3c) were identified where 13 pit locations were superimposed and described by excavation of fresh pits in the field. More than one soil pit were enclosed by soil mapping. Thus classifications were made based on soil association. GPS receivers guided the field survey team. At each pit location, soil samples of each horizon and control section were obtained for further laboratory analyses and soil classification made following USDA method. Soil samples were then transferred to recognized laboratories in Kathmandu for analyzing physical and chemical properties using standard methods including texture, organic matter, pH, N, P, and K of soil. Lands were found laying on nearly level landscape (<3 degree slope). The results show that at Order level, there occur only three kinds of soils, i.e., Alfisol, Entisol and Inceptisols which occupy about 1.23%, 2.63% and 93.72% of the total area, respectively. At sub-order level, Udalf, Orthent, Ochrept, Udept and Umbrept are most commonly found soils. At great- group level, a myriads of soils are found mostly falling under Inceptisols. Aberrations were found common while classifying soils at sub-group level. No clear relationships were found between soil profile characteristics, soil fertility status (nutrients level) and crop productivity dynamics of the area. It appears that landuse planing for choosing better agriculture system/practice should also be aided by field level experimentation and in-depth knowledge of other local biophysical factors that control the land productivity.
**Keywords:** Soil database, micro-level planning, profile description, soil mapping units and land systems
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**(7180 - 2387) Brazilian Soil Classification System (SiBCS) reached 20 years - results and advances**

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In 1997, a group of scientists led by Embrapa Soils with Universities and research institutions from Brazil presented the first complete document of the Brazilian Soil Classification System (SiBCS), in search of contributions from all pedologists. The first approximation was released in 1978, with new versions in 81 and 88. The first edition of SiBCS was published in 1999, with an Executive Committee that has the goal of validating, and evaluating proposal of new classes. Regional groups contribute to development of the SiBCS, and are supported by Embrapa and Brazilian Soil Science Society (SBCS). A national classification unifies soil data and allows inclusion of classes important to Brazil, in terms of agriculture and their unique environments, such as Pantanal and Caatinga. Another relevant part of SiBCS project is the Reunion of Classification and Correlation of Soils (RCC). The last RCCs visited areas that were not known by many pedologists in Brazil. In 2010, Acre state held a RCC; it was the first correlation in Amazon region. In 2012, it was in Pantanal and Cerrado region of Mato Grosso. In 2015, Roraima was visited for the first time by a large number of soil scientists, with unexpected ecosystems, including soils more related to dry regions of Brazil than Amazon Forest. The most recent, in 2017, crossed Rondônia, visiting ecosystems from Amazon Forest, high altitude grasses and shrub fields, large flood plains, to Cerrado. During the RCCs, specialists in soils examine profiles, previously sampled and characterized, along a route established by the organizing group, to review the classification and to propose new classes or change criteria. The RCCs trains new professionals, and allow exchange of knowledge about soils and environments of regions usually not known by many pedologists; and to local scientists helps to form research networks. The last contribution was to fuel the interest on detailed soil surveys. This supports the national wide program identified as Pronasolos, a response of Embrapa, leader of the project, from a demand of Brazilian government, with collaboration of a large number of Universities, research and extension institutions, and government sectors of Brazil. It became clear to decision makers, at the government level, that to manage and optimize agricultural practices toward sustainability of the agro-ecosystems, and preservation of natural resources, it is essential to know the Brazilian soils in detail.
**Keywords:** National soil classification; field correlation; Pronassolos
**Financial support:** Embrapa; SBCS; UFRRJ; IBGE; UDESC

**(4508 - 1610) Development of an expert system for classification of Brazilian soil profiles**

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The Brazilian Soil Classification System (BSCS) is the official taxonomic system for soil classification in Brazil. With the collaboration of professionals from several research and teaching institutions in the country, BSCS is in its third printed edition. Although it has been published many years ago, there is still no widely available computer program that simulates the decision-making of domain experts for the classification of Brazilian soils. The objective of this work is to build an expert system to assist professionals who need to classify Brazilian soil profiles. Based on the BSCS rules, the system simulates the reasoning of a domain expert when performing the classification of soil profiles. In addition to assisting the work of pedologists, the system can be used as a didactic resource, since it can explain in detail the path that leads to a particular solution. The system is in the prototype phase and has been developed in the Prolog language. It is able to classify soil profiles according to BSCS in different categorical levels, according to the data provided. Tests are being conducted on hundreds of samples already classified by domain experts. The development of this system brings many benefits, to wit: a) it increases the availability of knowledge on soil classification; b) it assists in the dissemination of BSCS, since it is documented not only in the form of publication, but also in software format; c) it is a rule-based system, so its development can be incremental, enabling consistency and performance tests as new knowledge is introduced; d) it has been developed using free software, resulting in reduced costs for its