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J. Brauneck, R. Baumhauer

ECORATE – A METHOD FOR ASSESSING CHANGES OF ESF AND ESS IN FRAGILE AGRARIAN LANDSCAPES IN RESPONSE TO CLIMATE CHANGE

University of Wuerzburg, Germany

The paper is the multidisciplinary project to finally provide a standardized planning tool for *Economic Regional Assessment Tool for Soil Erosion (ECORATE)* focussing on the soil as an irretrievable resource including future demographic change, land use change and climate change. The assessment of substrate ESF and ESS is at the heart of the geoscientific side of the project.

Key words: method for assessing, soil erosion, ESF, ESS, climate change.

І. Браунек, Р. Баумхауер

Вюрцбурзький університет, Німеччина

ЕРМОЕҐ – МЕТОД ОБЛІКУ ТА ОЦІНКИ ВПЛИВУ КЛІМАТИЧНИХ ЗМІН НА ЕФЕКТИВНІСТЬ ҐРУНТОВОЇ РОДЮЧОСТІ (ESF) ТА ЗОВНІШНІХ ВПЛИВІВ НА СЕРЕДОВИЩЕ (ESS) У НЕСТАБІЛЬНИХ АГРОЛАНДШАФТАХ

Представлені матеріали отримані в рамках мультидисциплінарного проекту щодо розробки Економічно реального механізму оцінки ерозії ґрунтів (ЕРМОЕҐ). Об'єктом вивчення ЕРМОЕҐ виступає ґрунт як невідновний ресурс, з урахуванням майбутніх демографічних, кліматичних змін та змін землекористування. Оцінка ESF та ESS – головна складова геонаукового боку проекту.

Ключові слова: метод оцінки, ерозія ґрунтів, ESF, ESS, кліматичні зміни.

И. Браунек, Р. Баумхауэр

Вюрцбургский университет, Германия

ЭРМОЭП – МЕТОД УЧЕТА И ОЦЕНКИ ВЛИЯНИЯ КЛИМАТИЧЕСКИХ ИЗМЕНЕНИЙ НА ЭФФЕКТИВНОСТЬ ПОЧВЕННОГО ПЛОДОРОДИЯ (ESF) И ВНЕШНИХ ВОЗДЕЙСТВИЙ НА СРЕДУ (ESS) В НЕПРОЧНЫХ АГРОЛАНДШАФТАХ

Представленные материалы получены в рамках мультидисциплинарного проекта по разработке *Экономически регионального механизма оценки эрозии почвы (ЭРМОЭП)*. Объектом изучения ЭРМОЭП выступает почва как невосполнимый ресурс с учетом будущих демографических, климатических изменений и изменений землепользования. Оценка ESF и ESS – главная составляющая геонаучной стороны проекта.

Ключевые слова: метод оценки, эрозия почвы, ESF, ESS, климатические изменения.

Climate, demographic and land-use change all pose major challenges to land use, mainly so in highly sensitive and fragile landscapes, irrespective of climate zones. Of particular relevance, with respect to the project proposed, are regions of intensive agrarian land use with soils formed on unconsolidated rocks. Such rocks, e.g. marls, loess, volcanic tuffs and saprolites, because of their nutrient, water-holding or aeration capacity, have been preferred locations for food production since the beginnings of agriculture**.** A drawback is the high erodibility of those substrates, by which these landscapes become easily subject to massive degradation if the carrying capacity of those regions is exceeded.

It is the target of the multidisciplinary project to finally provide a standardized planning tool for *Economic Regional Assessment Tool for Soil Erosion (ECORATE)* focussing on the soil as an irretrievable resource including future demographic change, land use change and climate change. In intensively used agro-landscapes the substrate has a whole range of ESF and ESS, as it not only ensures food production, but is also the key element for the transport of matter, i.e. retention, buffering and the release of water, nutrients and hazardous substances. As yet there is no robust and standardized procedure for assessing

and evaluating (e.g. moneywise) the substrate, and also not for evaluating the dynamics of the system which, in its dependence on climate and land use, is subject to continuous change.

The assessment of substrate ESF and ESS is at the heart of the geoscientific side of the project. The estimation of erosion risk can be differentiated into potential erosion and current soil erosion risk. Thus, mapping of morphodynamics as it is shown by erosional and depositional features is essential. Spatially differentiated estimation of potential erosion can be facilitated including spatially differentiated information on relief as it is provided by DEMs, soils and climate data. Including information on human impact such as land use, estimation of current soil erosion risk can be facilitated. In all cases it should be payed attention that the study site corresponds to a drainage basin as a naturally given open system. This procedure finally may lead to the development of a modeling approach where weighting of state variables as given by secondary data is calibrated by field investigation. It is assumed that each landscape unit has its own internal dynamic equilibrium which is reflected in the weighting of the state variables. All study sites are situated in regions of high landscape sensitivity and will thus be particularly exposed to the consequences of climate change.

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