

# New Swiss Guidelines for Valuation of Agricultural Ground Include Ecological Values and Support Sustainable Development

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**Key words:** Consideration of ecological values, estimation of agricultural ground, land settlement projects.

## ABSTRACT

The valuation of agricultural ground in land settlement projects, where small, hard to cultivate plots are changed into bigger, well cultivable allotments, was upon today fixed to the soil fertility alone. Therefore only economical criteria were considered. Land that has a mere ecological value, like swamps and poor meadows, was underestimated because government pays subsidies for maintenance and the shortcomings in yield.

The new guidelines for bonification (Bonitierungsanleitung) now point the way to a more accurate and sustainable estimation of the entire agricultural ground. There are two methods proposed: One is to convert bonification-points into monetary values and to take government subsidies as a substitute for actual yield. This would allow a trade-off between lots that do not compare economically. The method, however, requires an ample collection of data and involves complicated calculations. The other method is to categorize the accepted natural sites and to estimate them according to their biological value. An exchange will then be made only between the natural sites. Exchanges with agricultural land – for instance to ensure a sustainable maintenance – are possible, but the exchange rate would be subject to case-specific negotiations.

The guidelines consider also the legal aspects (guarantee of ownership). The publication is scheduled for spring 2002.

## RESUME

L'estimation des terres agricoles dans le cadre des remaniements parcellaires, la bonification, était jusqu'à maintenant basée sur des valeurs économiques. Les surfaces de haute valeur écologique, comme marais et prés maigres, sont sous-estimées car les frais d'entretien sont subventionnés par l'état. La nouvelle ordonnance de bonification montre une procédure pour une estimation plus juste et précise du terrain entier agricole. Deux méthodes sont décrites: d'une part la transformation des cotes du sol et des contributions en rendements économiques. Comme ça un échange général des terres peut être garanti. D'autre part l'estimation des sites naturels respectifs aux critères écologiques pour un échange en soi. Les deux méthodes mènent à une estimation plus approfondie des terrains écologiques et à une exploitation plus durable.

## ZUSAMMENFASSUNG

Die Bewertung von Landwirtschaftsland im Rahmen von Landumlegungen, die sogenannte Bonitierung, erfolgte bislang aufgrund des erzielbaren ökonomischen Ertrags. Ökologisch wertvolle Flächen, wie Moore oder Magerwiesen, werden unterbewertet, denn deren Pflege wird heute vom Staat subventioniert. Die neue Bonitierungsanleitung zeigt den Weg zu einer genaueren und gerechteren Bewertung des gesamten Landwirtschaftslandes. Es werden zwei Methoden beschrieben: Einerseits die Umrechnung der Bodenpunkte und Zahlungen in betriebswirtschaftlich verzinsbare Ertragswerte, womit ein genereller Landabtausch möglich wird. Andererseits die Bewertung der bekannten naturnahen Flächen nach ökologischen Wertmassstäben, was einen Abtausch unter sich ermöglicht. Beides führt zu einer höheren Wertschätzung der Ökoflächen und damit zu einer nachhaltigeren Bewirtschaftung

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# **New Swiss Guidelines for Valuation of Agricultural Ground Include Ecological Values and Support Sustainable Development**

**Alfred BOLLINGER, Switzerland**

## **1. PROBLEM**

In Middle Europe (Austria, France, Germany, Switzerland) agricultural allotments are often still of an unfavorable structure as a consequence of the ongoing subdivision of realty following inheritance. One current goal in land settlement projects is to transform those small and ill-shaped plots into larger, more easily farmable units. The allocation of new allotments should thereby guarantee that both new and old estates are of equal value. Until now a trade-off strictly followed economical criteria and land was valued according to the estimated agricultural yield of the soil. More recent approaches also foresee compensation-payments according to ecological value – as defined through government subsidies for conservation of natural sites – or according to land price, as realistically achievable in the deregulated market..

The process of property transformation is also suited to gain land for public construction projects, such as highways or new railway-lines. Should a collective expropriation be necessary, the claims are diminished by a certain percentage. The loss of land is then in turn paid-off to the respective owners as money. In the same way, conservationally important sites can be transferred from private to public property. State and communities usually have surrogate properties to offer. A satisfactory valuation of the exchange rate is, however, crucial.

## **2. PRINCIPLES OF BONIFICATION**

The valuation of agricultural land is known as „bonification“. Bonification of land and soil aims at fixing exchange rates for the entire area to be settled in a way that allows to interchange lots of variable topographic expositions and soil characteristics and – at the same time – to preserve net value of realty for each proprietor involved. Valuation of each location's quality thereby guarantees preservation of assets. The bonification-values to be determined serve to calculate each land-owners claims according to the status quo on one hand, and the value of the land which individual owners receive, on the other (so called „allotment values“). Bonification provides the basis not only for the exchange of land, but also (along with the estimation of value added and subtracted) for the calculation of all differences between old and new inventories that need to be refunded as money.

Bonification does not depend on parcellary structure or ownership proportions. It considers the potential value, not the status quo, and bases itself upon easily reproducible, objective, explicable and scientifically sound principles. The exchange value of a certain property only needs to withstand scrutiny when compared to that of other properties within the same perimeter. Therefore, within the same perimeter, absolute values are irrelevant. All that mat-

ters is, how bonification-values and exchange rates are set on a relative scale. Bonification-values can therefore be expressed as monetary values (e.g. corresponding to agricultural yield) or as dimensionless bonification-points, provided they are corrected to account for structural impediments and market influences.

To compensate for net changes in land value inherent to the procedure and to determine exchange rates for land transfer across zony borders, however, bonification-values need to be converted to market values.

### **3. DETERMINATION OF BONIFICATION-VALUES**

Land settlement projects are carried out by a cooperative, consisting of all land-owners concerned. The cooperative's members elect an executive commission which then designates a surveyor to elaborate and coordinate the project, a pedologist and a valuating-commission with the task of valuating the soil. The latter is recruited from amongst particularly well qualified farmers.

The pedologist now – with the help of outcrops up to 150 cm deep – determines the mere agricultural soil value according to its fertility. He also takes climatic characteristics as well as inclination into account. Soils of equal characteristics are then grouped on a map, regardless of respective ownership. Additionally, each outcrop is rated on a scale of 1 to 100. The valuating-commission now refines the coarse framework drawn out by the podologist and fixes a cadastre based on soil values. The commission thereby makes allowances for particular agricultural impairments caused by shade from nearby forests, slopes, open trenches and the like. These impairments are then expressed in terms of a depreciation of the previously determined value of the soil. A simple overlay of land registers for both soil value and parcellary ownership then allows to determine the exchange value for each individual property. The sum of all parcels' values for a particular owner then result in that owner's claim. The only criterion for the allotment of new properties is now that their value has to sum up to exactly meet that claim. A brief synopsis of the entire procedure is given in Figure 1 below:

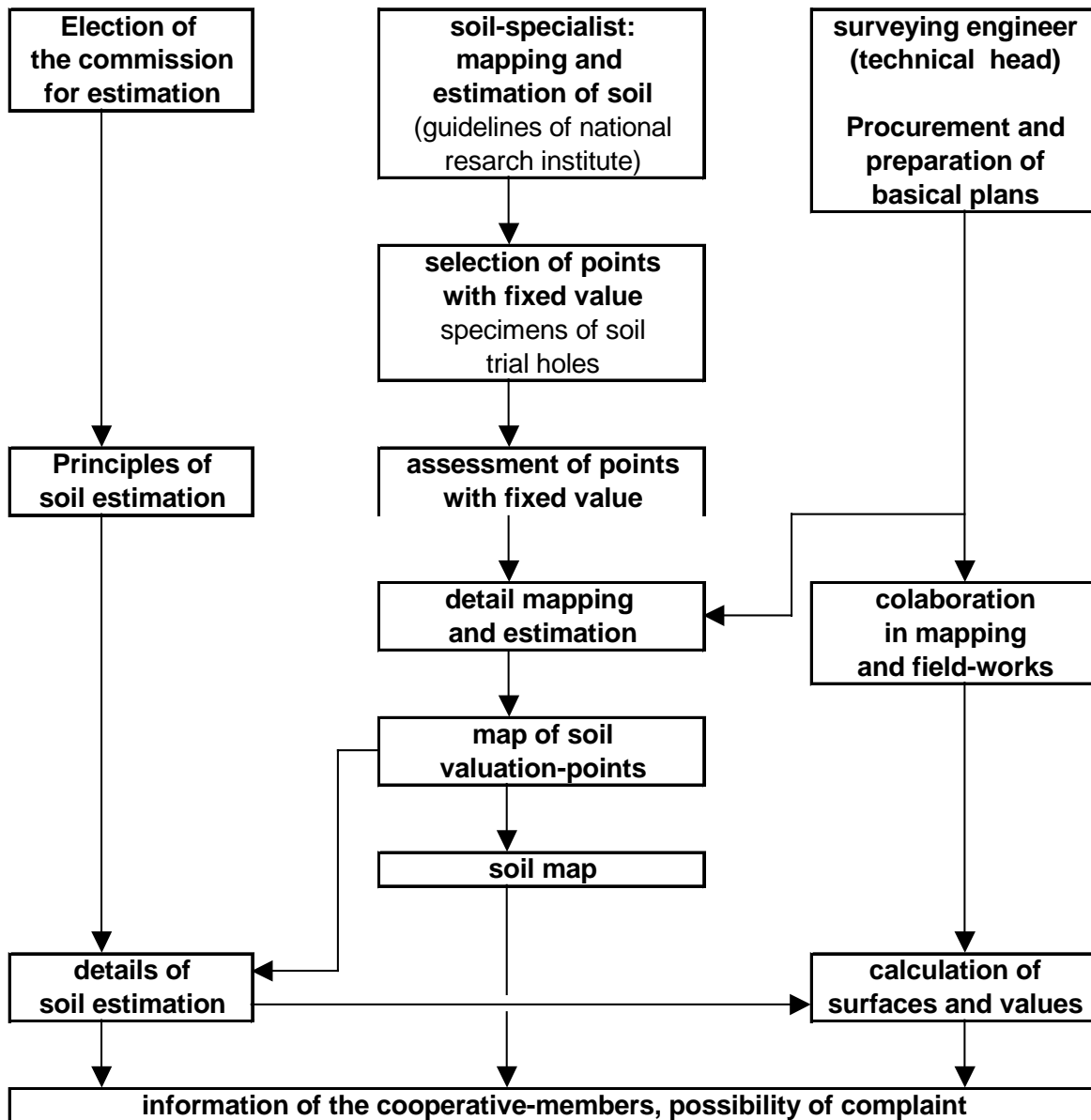


Figure 1: Schematic Bonification Procedure

The claims can never be fulfilled entirely in the redistribution process. Resulting differences (positive and negative) need to be compensated through financial payments. A correction value, representing the discrepancy between bonification-value and market value is needed. This correction value is usually determined according to a compilation of purchase prices which is created by the cooperative during the course of the whole enterprise.

If bonification is based exclusively on agricultural potential, this results in an underestimation of ecologically valuable areas, as their agricultural yield is low. The government, however, pays subsidies for maintenance and preservation of traditionally underestimated natural sites today, allowing for a respectable income to be achieved even from properties that are

agriculturally unfavorable. These payments help to raise esteem for conservational concerns and contribute to a sustainable management of natural sites. Furthermore, agricultural production has to face the problem of fluctuating product prices caused by the opening of global markets, as well as ever-strictening animal protection laws. Moreover, government funds are no longer distributed as product-subsidies, but rather as area-dependent direct-payments.

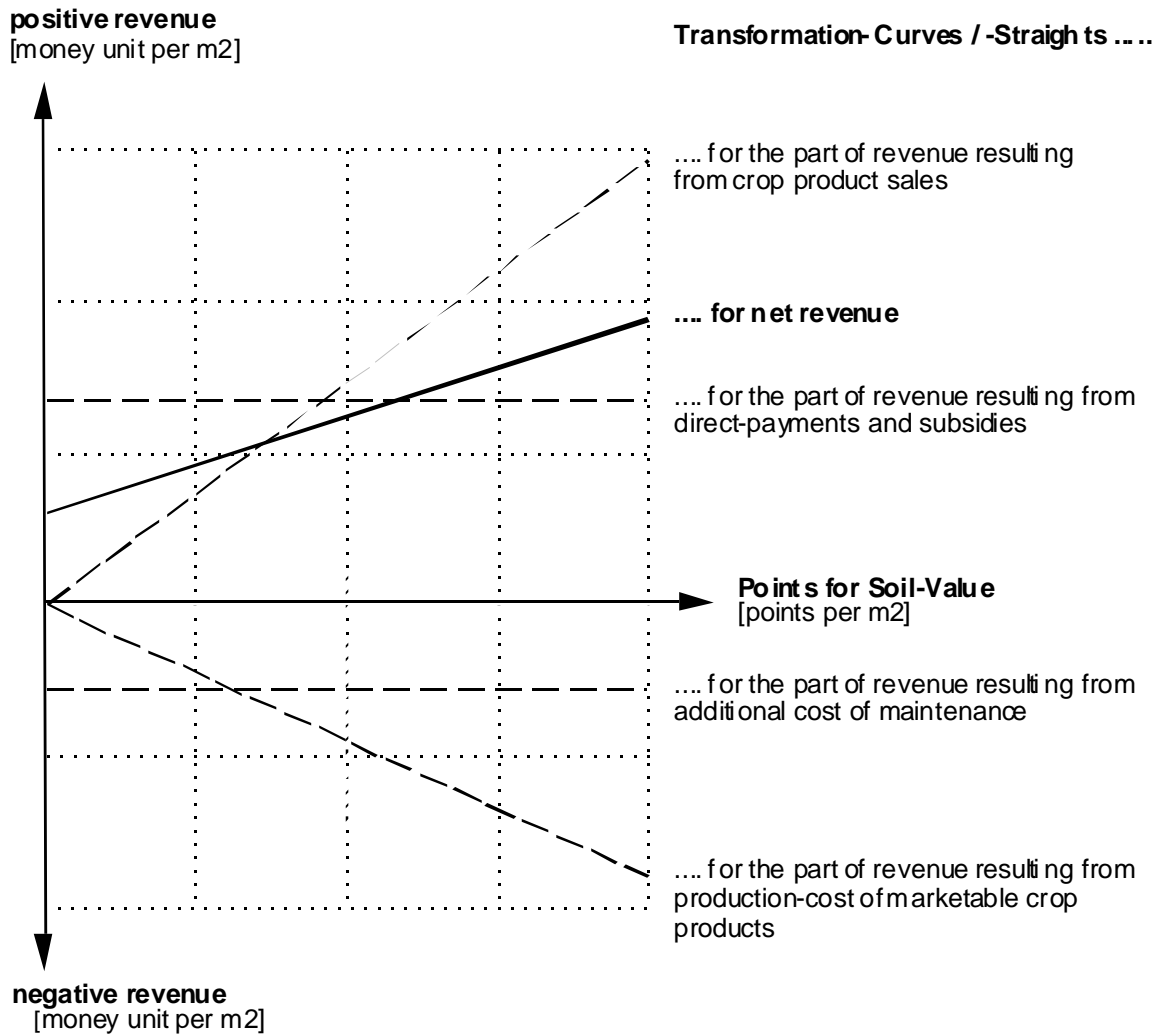
As a consequence of the aforementioned development, appreciation has tendentially shifted away from productive soils, towards the less productive, and continues to do so. Soil fertility plays a less dominant role in contributing to land value. Rather, higher importance is attached to value components that are independent of soil fertility. This is especially true for areas that are ecologically valued and that hold the promise of returning a corresponding financial revenue.

#### **4. VALUATION OF CONSERVATIONALLY IMPORTANT SITES**

The new guidelines for bonification (Bonitierungsanleitung) now point the way to a more accurate and sustainable estimation of the entire agricultural ground. There are two methods proposed: One is to convert bonification-points to monetary values (method Dr. M. Calörtscher) and to take government subsidies as a substitute for agricultural yield. This would allow a trade-off between lots that do not compare economically. The other method (Bernese model) is to build a cadastre of the accepted natural sites and to estimate them according to their biological value. An exchange will then be made only between the natural sites within the cadastre. Exchange for agricultural land – for instance to ensure a sustainable maintenance – is possible, but the exchange rate would be subject to case-specific negotiations.

Both methods foresee an ecological rating which takes place in two steps. Data about natural elements and habitats are gathered area-wide and rendered in an eco-map. Likewise for linkage-elements and natural barriers. A point-plan then allocates points to the above elements based on ecological criteria, such as quality, abundance, integrity, endangerment, size or potential within a relative framework.

According to the Calörtscher method – introduced by the author at the 1988 congress in Brighton – all value components, soil-dependent, as well as soil-independent, are transformed into financially accountable revenues and are then plotted against soil-points. This transformation accounts for product-price-level, direct-payments and subsidies, production costs as well as loss of income and/or maintenance costs associated with extensive, ecological utilization of the soil. The resulting transformation-curves (or -straights) then yield a picture of how financial revenue depends on soil-points. A schematic representation of the output is given in Figure 2 below. As eco-payments vary between different parts of Switzerland, no unitary transformation-curves can be given for the entire country.



**Figure 2:** Schematic Representation of an exemplary Transformation-Straight

Transformed values – once corrected to account for farming restrictions – serve to calculate claims as set by the inventories before and after land-settlement. This allows even the interchange of lots with disparate utilitary purposes. Transformation-curves may also account for ecological potential, as the possibility stands to effectuate – on a contractual basis – payments for the extensification or the set-aside of land for a limited period of time. Compensation payments, again, involve the implementation of a correction value as determined by the purchase price for the most valuable land..

The Bernese model is restricted to the value-preserving interchange of ecologically valuable sites. The respective lots are rated with points. These points have the same significance as traditional bonification-points for mere soil value. Multiplication with the respective ground-area yields an exchange value for all natural sites a particular participant owns and that should be substituted by surrogate (eco-)land of equal value. Should it be necessary to exchange extensively farmed lots, such as moors, hedges or oligotrophic meadows for arable land, or should compensation payments for an expropriation become necessary, the market

value has to be negotiated. Since the perception of that value may vary greatly according to supply and demand, a uniform determination, as provided with the Calörtscher method, is not always simple.

Even though both methods were published about five years ago, they have only been applied in few cases. The conference of the supervising authorities has thus decided to publish again a new edition of the bonification guidelines, including both methods in an understandable and comprehensive form. Legal questions, in particular court decisions dealing with relevant issues concerning guarantee of ownership shall be stated and commented. This is to give cooperatives and leading engineers legal support for their decisions. The new guidelines are scheduled to appear in spring of 2002. Just in time to provide the basis for a fair and accurate valuation of soil in the remaining land-settlement projects, which will help to secure a sustainable cultivation of agricultural land and care for ecologically valuable sites.

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## BIOGRAPHICAL NOTES

**Fred Bollinger**, born 1949, studies at Federal Technical Institute of Zürich 1970 –74, diploma as surveying-engineer with specialising in land settlements. Since 1978 working for the administration of the Canton of Zurich in supervision of land settlement projects. National delegate of FIG commission 9, president of the national working group for land consolidation.