Conclusions and recommendations of the TEHO project (More effective agricultural water protection 2008 - 2011)

16 key conclusions and recommendations were made based on the experiences gained in the project.

The Environmental handbook and farm specific advice

1. Based on the experiences gained in the project, cooperation between farmers and advisors in planning environmental protection by utilising an environmental handbook produces good results. It enables farm specific development targets to be identified and the order of priority to be established while also taking economic aspects into account. Many measures can also be financially profitable to the farmer. Besides being a good aid to farm specific advice, the environmental handbook developed in the project could also be part of the agri-environmental scheme. The environmental handbook would be best suitable to be one of the additional or special measures of future the agri-environmental scheme.

2. A prerequisite for holistic environmental planning at the individual farm level is the rapid development of information systems. Different databases of the administration, results of soil fertility analyses and information in the farmer’s own cultivation records should be possible to easily combine so that they could form the base for the environmental handbook and planning of suitable measures for the farm. This requires development of data transfer and interaction so that farmers can by themselves transfer farm specific information to the environmental handbook. Information of the general plans of buffer zones and wetlands as well as data on topography and erosion risk areas could be included in the VIPU service (an internet service where farmers can fill out electronic applications forms for subsidies and see digital maps of their fields). The TEHO Project showed that farm specific maps utilizing information systems are a good aid to targeting and giving individual farms advice.

Targeting water protection measures

3. Water protection measures should be targeted more than at present. Targeting is needed by catchment areas as well as by line of production and even by fields so that the measures are as effective as possible. Actions to be taken also depend on whether the aim is to prevent nitrogen or phosphorus loading. Special measures should be targeted in areas where attaining good ecological status of watercourses is the most challenging.

4. Special attention needs to be paid to erosion control where fields are sloping, the soil type is sensitive to erosion, field phosphorus levels are high and watercourses are close. Erosion prevention through plant cover in winter, reduced tilling and buffer zones must be better focussed to these areas than at present. Also, leaching of particle phosphorus can be prevented with these measures. At the same time, one must keep in mind that nutrients can also leach through sub-
surface drainage systems. To prevent leaching from sub-surface drainage, it is essential that plants are being fertilized according to their needs.

**More efficient use of nutrients**

5. *More attention should be paid to the growing conditions of the soil and to diversifying crop rotation.* They play an important role in efficient use of nutrients, sequestration of carbon to the soil and reducing nutrient leaching. More measures related to these aspects should be included in the future agri-environmental scheme.

6. *Cultivation of catch plants should be enhanced* because catch crops can take up nitrogen and other nutrients that remain in the soil after the harvest as well as ensure that there is continual plant cover on the ground until the end of the growing season. This measure that also increases biodiversity is poorly known and utilized in our country. The subsidy sum paid for cultivating catch plants should be increased. In addition, conditions of committing the measure in the agri-environmental scheme should be more flexible (for example the decision for planting catch crops could be made annually like is now done for nature management fields) and at the same time more advice and information about cultivation of catch plants should be available.

7. *Nutrient balances should be utilized more to help plan more efficient use of nutrients.* *Calculating the balances is a good aid for planning and advice.* Nutrient balances are a practical tool to examine the use of nutrients and also the economical factors affecting profits on farm or parcel level or by different crops. Programmes for cultivation planning should be developed so that the balances could be better utilized than at present. Most of all, more information on how to interpret the balance calculations and how they should affect farming practices is needed. Nutrient balances can be chosen as an additional measure in the current agri-environmental scheme. Calculating the balances would be a suitable additional measure also in the future AES but the method of implementing the measure should be changed. However, it would not be appropriate to make nutrient balances a compulsory part of the agri-environmental scheme because the calculations include many uncertainties.

8. *Efficient utilization of nutrients from manure should be promoted in all means possible.* Injection of slurry and precision spreading of manure should be enhanced. Also, techniques of injecting slurry during sprouting should be further developed to make this method more common. If manure would be spread more in spring there will be less need to spread manure in the autumn which increases the risk of nutrient leaching. There should be better incentives to enhance the cooperation between farms with animals and farms with only plant production so that the nutrients in manure can be spread to a wider area. More financial support for investments in manure spreading equipments and remote storing of manure is needed as well as in manure processing methods (separation, acidification) which should be further developed. The all nutrients in manure should be taken into account in fertilizer plans. Currently, for example only 85 % of total phosphorus in manure is taken into account.
Diversifying the production structure

9. Grassland cultivation is now concentrated in certain areas but grasslands should be more evenly distributed around the country. In addition, there should be financial support to promote grazing. This would contribute to the management of grasslands which are important to water protection and biodiversity. Cultivating grasslands makes the crop rotation more diverse and maintains plant cover on the ground in winter. However, if there is no use for grasslands, their cultivation is not sensible. Alternative usages for the green plant material that is harvested from buffer zones or other special measure areas of the agri-environmental scheme should be explored.

10. Organic farming and its good practices in for example recycling nutrients should be promoted. Organic farming can contribute to several objectives of water protection because its form of production requires among others efficient recycling of nutrients, utilization of organic fertilizers and diversified crop rotation with grasslands. Organic production also promotes biodiversity. The efficiency of organic production should be further improved.

The new and old methods in water protection and monitoring

11. In addition to new innovations in water protection, the already existing methods need to be put into action. This can be done by developing the support systems and improving advice and communication so that good practices and existing research results spread among the farming community.

12. The monitoring of water quality needs to be developed and enhanced on catchment area, farm and parcel level so that the impact of farming practices and agri-environmental measures can be assessed. More field experiments and research on farms is needed. The information about water quality clarifies the situation for all stakeholders and reduces prejudice.

Good methods of promoting water protection

13. Considering environmental aspects while leasing out fields is an opportunity to promote water protection. This can happen by changing the current situation and making longer rental agreements. Longer agreements give better incentive to the tenant to maintain good soil structure and make special measure contracts (which can only be done for a minimum of five years) like establish buffer zones. In the rental agreement, there can also be conditions that obligate certain agri-environmental measures or practices. The extra conditions and costs paid by the tenant for meeting the conditions should be taken into account in the rental agreement.

14. Farm specific advice is needed to make the special measures of the AES (like buffer zones and wetlands) more attractive and attainable to farmers. One way of making special measures more attractive is to reduce bureaucracy by changing some of the special measures into additional measures.

15. The method of the TEHO project, which is based on cooperation between farmers’ union, farmers and environmental authorities, has been proven to be a good and functional way of promoting water protection in agriculture.
16. The persistent work done on farms to promote water protection needs recognition and support to maintain the level of protection is needed also in the future. The existing good practices and agri-environmental measures are important to maintain while focusing on the issues which have to be tackled with new methods.

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