ECONOMIC, ENVIRONMENTAL AND HEALTH CONSEQUENCES OF LARGE–SCALE CONVERSION TO ORGANIC FARMING IN FRYSLÂN, GRONINGEN AND DRENTHE

EXECUTIVE SUMMARY

Author: Dr Darko Znaor

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Background information

This study was commissioned by the three Northern Netherlands Provinces: Fryslân, Groningen and Drenthe. Their policy makers wanted to get a deeper insight about what the expected consequences of a potential large-scale conversion to organic farming could bring to society in the Northern Netherlands, notably in terms of economy, environment and human health.

Approach

In order to answer this, we compared the performance of the current agricultural production (based on the most recent data, mainly from 2015) with the expected performance arising from nine organic agriculture scenarios. The organic scenarios comprised different shares of agricultural land under organic management (20%, 50% and 100%) and different price premiums (0%, 10% and 25%). The combination of different land areas under organic management and price premiums resulted in a total of nine organic scenarios. The performance of both the baseline and the nine organic scenarios are assessed against two benchmark indicators: labour force (jobs) and real value added (RVA).

On a quest for real value added

The real value added is gross value added (GVA) that is “cleaned”, i.e. corrected for “hidden” costs and benefits arising from the creation of GVA. Hidden costs comprise environmental costs and benefits and public investments for agricultural subsidies. Using various environmental accounting methods we monetised the environmental damage to air, climate, water and soil. This damage impacts human health and ecosystem services and bear costs for society. They are expressed in a virtual currency called FUTURO. Public investments are expressed in a virtual currency called MATURO and RVA in PURO ("purified” Euro). These currencies have the same value as Euro. The economic sectors for which we assessed the RVA include primary agricultural production and the two farm-upstream sectors which we expected to be affected by large-scale conversion to organic farming: mineral fertiliser manufacturing and feedstuff production.

Complementary qualitative assessments

In addition to monetary assessment of RVA we also undertook a qualitative assessment of the impact of organic farming on food quality and biodiversity. Originally, we intended to monetise also the damage caused by resistance to antibiotics arising from the use of antibiotics in livestock. However, due to a lack of data we were not able to accomplish this assessment.

Organic farming creates more jobs

All organic scenarios create more jobs than the baseline. However, this contribution is small – up to 2% in the case of total conversion to organic farming. This is because grass-fed dairy farming prevails in the region. In this type of production, there is not much difference in terms of labour requirements between organic and conventional farming.

Organic GVA: 55-110% of the baseline

GVA in organic scenarios largely depends on the premium price attained. In case of total conversion and no premium price, organic farming creates 55% GVA of the baseline. However, with a premium price of 10%, the GVA increases to 77% of the baseline, while the premium price of 25% results in a GVA that is 10% higher than in the baseline. In case of total conversion to organic farming, a premium price of 21% would be required to create the same GVA as in the baseline.

Organic farming is better for the environment

All organic scenarios are better for the environment than the baseline. A total conversion to organic farming results in the lowest emissions. Compared to the baseline, the reduction of air pollutants in this scenario varies from 92% for SO_2 to 8% for NH_3. The acidifying potential is reduced by 10% and greenhouse gas emissions by 12%. In case of total conversion to organic farming the N loss from soil is 41% lower than in the baseline, while the total N loss is 31% lower and P loss 50% lower. Both the baseline and organic scenarios sequester carbon in the soil. The baseline is 7% better in this respect than the scenario assuming a total conversion to organic farming.

...creating lower environmental costs

Because of lower emissions, all organic scenarios result in lower environmental costs than the baseline. However, environmental costs both in the baseline and organic scenario are massive. Our original assessment, which is largely based on the European Environment Agency environmental damage cost factors, suggests that environmental costs account for 62% of GVA in the baseline and 46-91% of GVA (depending on premium price) in case of total conversion to organic farming. However, a complementary assessment based on lower and central environmental damage cost factors suggested by a Dutch think-tank CE Delft results in much higher environmental costs, ranging from 100-160% of GVA in the baseline to 73-240% of GVA in the scenario of total conversion to organic farming.

Damage to air – by far the biggest environmental cost

Damage to air is by far the most significant environmental cost. In our original calculation, it accounts for 65% of all environmental costs in the baseline and 70% in the scenario assuming total conversion to organic farming. In the assessment based on the CE environmental damage cost factors the share of damage to air is even higher. In the baseline it accounts for 76-81% of all environmental costs and in case of total conversion to organic farming 80-87%.

Ammonia – related costs remain a puzzle

With a share of about half of the total environmental costs, ammonia is by far the largest source of environmental damage, regardless of the assessment methodology applied. However, there is significant uncertainty regarding ammonia emissions from organic farming. Currently, there are various positions regarding the amount of N in the excrement of organic livestock and the portion that is emitted in the form of ammonia. The debate about this is still going on. In this study we have opted for a conservative approach and applied ammonia emission factors suggested by current Dutch publications. However, it should be noted that the reliability of these factors is questionable and that they are quite unfavourable for organic farming. It is quite possible that future studies will provide new insights and new evidence justifying other positions and approaches. In case these show that the ammonia emission in organic farming is lower than currently anticipated, the organic farming scenarios will result in even lower environmental costs, shifting the findings of this study much more in favour of organic farming.

Hidden costs

Public investment costs (direct payments for agriculture) are the same both in the baseline and all nine organic scenarios. When these costs are added to the environmental costs, the hidden costs according to our original calculations account for 83% of GVA in the baseline and 65-129% of GVA in case of total conversion to organic farming. The use of the CE environmental damage cost factors results in higher hidden costs. They account for 121-181% of GVA in the baseline and 92-277% of GVA in case of total conversion to organic farming. If hidden costs were internalised, the price of agricultural produce should rise. In the baseline this rise would range from 24% (original calculation) to 35-53% (CE damage cost factors). Nearly the same rise would be required in case of total conversion to organic farming and no premium price: 26% (original calculation) and 37-56% (CE environmental damage cost factors).

100% conversion to organic farming requires a premium price of 8% to 15% to attain the same real value added as in the baseline

According to our original calculation, the RVA of the baseline accounts for just 17% of GVA. However, when the CE environmental damage cost factors are used, the RVA of the baseline is negative, ranging from -21% to -81% of GVA. The RVA of total conversion to organic farming in our original calculation ranges from a negative value of -29% of GVA (no premium price) to a positive value of 8% of GVA (10% premium price) and 35% of GVA (25% premium price). A total conversion to organic farming using the CE environmental damage cost factors results in a RVA of -83% to -177% of GVA (no premium price); -31% to -99% of GVA (10% premium price) and -40% to 8% of GVA (25% premium price). Our original calculation suggests that under total conversion to organic farming, a premium price of 15% would be required to attain the same RVA as in the baseline. In the calculation based on the CE environmental damage cost

factors, a premium price of 8-12% is required to reach the same RVA as in the baseline.

Non-monetised benefits of organic farming

From our research it also appears that organic farming exhibits several benefits that are very difficult to monetise. These should be added to the positive "equation side" of organic farming and include the following:

1. Biodiversity: organic farms tend to have higher biodiversity than conventional ones.
2. Organic animal husbandry uses far fewer antibiotics than conventional husbandry, which reduces antibiotic resistance to bacteria and lowers social costs.
3. Organic food quality is superior to conventional in several aspects.
4. Organic food can provide a range of health benefits.
5. Organic livestock is not fed by GMO feeds.

When in the future one or more of these aspects is monetisable, this will shift the balance in favour of organic agriculture.

A framework for discussion

This study does not pretend to have provided the ultimate answer to the complex question whether organic farming is better for society in the Northern Netherlands or not. The findings presented in this study should be considered just as first approximations, likely requiring further improvements. The ultimate goal of this research was not to provide meticulous calculations. We believe that the most valuable contribution of the findings presented in this study is in providing a framework for discussion about the feasibility of large-scale conversion to organic farming in the Northern Netherlands – rather than providing finite and errorless calculations. The provision of this discussion framework is hoped to be an important starting point for further analysis and contribution to a dialogue leading to effective policy decisions. We hope that what is presented in this study will help policy makers in the Northern Netherlands as well as all other interested parties in their quest for sustainable agriculture.

Avalon Foundation

T: +31 (0) 622 517 356
E: office@avalon.nl