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Farmers' Approaches to Ecological Agriculture

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Conversion to ecological agriculture as a process of social adaption was qualitatively analysed in Norway by the sociologists Barbro Vartdal and Arild Blekesaune in 1990-92. Altogether thirty-three farmers were studied, providing interviews, written diaries or reports. The farmers were participating in the "Thirty-farm project" at the Norwegian Centre for Ecological Agriculture (see Research in Brief). The farms were spread all over the country, with different types of production and different stages of conversion. Three categories of eco-farmers were described, according to whether the farmer was cosmopolitan or local in orientation: the anthroposopher, the ecosopher and the reformist. Their motivations for farming, conversion and mastering strategies as well as social barriers to conversion were described. The sociologists investigated converting to ecological farming as a process of social adaption, and argued that conversion is a social process as well as a process of agronomy.



The Theoretical Base

Treating ecological agriculture as a process of social adaption is quite a new approach. Extensive sociological literature was used to provide a theoretical basis for devising questions.

Greening: Ecological agriculture can be seen as part of the change of consciousness in society, characterized by Buttel (1992) as *greening*. He describes a change in the main objective of political struggle: environmental problems have become more important than social justice.

Peasant economy: Farming based on the working capacity of the family is often called "peasant economy" (Chayanov 1986). The aim of the family farm is not to maximize income, but to survive with an acceptable level of labour.

Innovation theory: An innovation is an idea or method that is regarded as new for a person or group. Even though ecological agriculture is not a "classical" innovation, sociological innovation theory was useful for studying the diffusion of ecological agriculture in time and space. This theory describes five categories of people, according to how quickly they adopt: innovators, early adopters, early majority, late majority and laggards (Rogers 1983).

Cosmopolitan versus local orientation: An important cultural difference can be found between cosmopolitan and local orientations (Merton 1968). Cosmopolitans are often the first to try new ideas (innovations), which can be adopted by larger groups of locally-oriented people.

Diffusion of new ideas: All diffusion of ideas takes place in social systems, which influence the diffusion. For instance, the way farmers interested in conversion communicate and exchange information, will influence how ecological farming spreads (Rogers 1983). Granovetter (1973) draws attention to "the strength of weak ties", pointing out that an extensive network of personal contacts is valuable, because it will yield more information more rapidly. Rogers also makes a distinction between "the Ups" and "the Downs" in a social system. The early adopters become "the Ups", who have knowledge about most information. This makes it possible for them to control the innovation, and to influence diffusion.

The Research

Method: Farmers were split into three groups. One group was interviewed in 1990 and 1992. Another wrote a summary diary. The third group wrote a report in 1990 and 1992. All farmers were questioned about being a farmer, the conversion process and project participation.

Motivations for farming, and negative experiences of the farming way of life: Vartdal and Blekesaune (1992) analysed the motivation of being a farmer in general, and especially the motivation for ecological farming. Describing why they wanted to be farmers, the participants emphasized:

- The close relation to nature, plants and animals.
- Farming is a very creative occupation.
- Farming is an active work, mainly carried out outdoors.
- A farm is a good place for children, and they can participate in the work.
- The former rural society had valuable traditions, which it is important to maintain.
- The possibility of satisfactory income is not the main reason for being a farmer, but the way of living.

However, being a farmer has a negative side. Vartdal and Blekesaune concluded that the following were sources of dissatisfaction in the farmers' way of living:

- It is exhausting to be dependent on natural variations and other risks beyond human control.
- A farmer has very little spare time. Much work has to be done in the late evenings and weekends, and it is seldom possible to take a week's holiday.
- Being a farmer today is a very lonely occupation.

The Ideal Types

According to whether the farmers were essentially local or cosmopolitan in orientation, Vartdal and Blekesaune identified three groups of eco-farmers. This does not mean that the farmers were, or could be strictly classified, but three ideal categories were described: Two were cosmopolitan-oriented, the *anthroposopher* and the *ecosopher*. The locally-oriented category was called the *reformist*.

With respect to the innovation process, the anthroposophers can be described as the eco-pioneers, the innovators. The early adopters were classified as ecosophers, and the early majority as reformists.

■ Cosmopolitan identification

A characteristic of cosmopolitan orientation is identification with the eco-movement. Postvedt (1993) pointed out the professionalism of the eco-farmer in the nineties is an important aspect. Eco-farmers want to be at least as good farmers as their conventional neighbours, in addition to what they have to achieve to farm ecologically. Often the female farmer plays an important role in the ideological part of the conversion.

The anthroposopher: The anthroposopher is characterised as a strongly motivated eco-farmer, who recognises the farmer's important task as a manager of nature. They see bio-dynamic farming as a way of personal development, with a growing intuition of the living organism that the farm constitutes. Human nutrition is especially important to the bio-dynamic farmer. Food is not only a source of energy, but the basis of a strong will and force to fulfill personal tasks. Cosmopolitan orientation often means that the anthroposopher has many contacts, mostly outside the local community. Many anthroposophers have had a period of working abroad, and foreigners often come to their farm to work and learn.

The ecosopher: The ecosopher agrees with the anthroposopher that conventional agriculture is the wrong way to farm, criticising specifically the waste of energy and other resources. They want their farm, or the local community, to be self-sufficient, and feel ecological farming is a way of practising solidarity with all poor people in the world. The ecosopher has an extended social network outside the local community, and often he or she is involved in organisational work. However, the ecosopher often has a social network in the local community as well, consisting of people who sympathise with the ecosophers and their way of farming.

■ Local identification

In line with their local orientation, reformists identify themselves with other farmers in the region. They do not want the eco-movement to be dominated by fundamentalist eco-farmers. But they often emphasize that the inspiration and information from more experienced colleagues was very important in their conversion.

The reformist: Vartdal described the reformist as sceptical of agricultural policy and the development of conventional agriculture, and inspired by the general greening of society. Lack of knowledge about conversion and lack of social contact with the eco-movement often delays conversion. When yields are not much reduced after conversion, this makes the reformist eager to continue. But they are not as strongly motivated as the cosmopolitan oriented eco-farmers. They often prefer to present their conversion as "ecologisation". They want to survive as farmers, and they are not convinced that ecological agriculture will give a satisfactory income.

Conversion Strategies

Cosmopolites prefer a rapid conversion. Their strategy is "all or nothing" (either - or): Either practice ecological farming, or find another way of living (not as a farmer).

The reformists prefer to convert more gradually. Their strategy is "both - and". They do not want to advocate a philosophy that differs much from their conventional neighbours before they are certain that they will make the final conversion. They evaluate the results and often remain undecided whether to convert the whole farm.

For each category of eco-farmer, there is a distinctive pattern of change in attitude and practice that is part of the conversion process. It is important how they integrate, or do not want to be integrated, with the eco-movement. Some new converts will integrate with the eco-movement and become a part of that social network. Others will create their own half-way house of ecological agriculture because they cannot, or do not want to, integrate totally and fulfill all the standards of ecological agriculture.

Maintenance of a local social network is beneficial for the well-being of the eco-farmer. On the other hand, there is a danger that the local network and need for local acceptance may prevent final conversion. Vartdal described this as the reformist's balance on the borderline of tolerance in the local community.

Social Barriers

An important challenge in the conversion process is to create an identity as an eco-farmer, and to establish a social network that responds positively to the conversion.

Challenges within the family:

It is necessary that both partners (when there is a couple on the farm) agree on the conversion and have approximately the same degree of motivation. Conversion often implies more work and less income at least for some time, and represents a challenge to loyalty and companionship.

Some eco-farmers experienced problems as parents, when their children differed from other local children, due to various consequences from being brought up within an eco-farming system. Social challenges also arise when the older generation on the farm is still active and does not support conversion.

Difficulties to be accepted in the local community:

Particularly those who started conversion several years ago experienced some local resistance, e.g. they did not get local bank loans. Others experienced lack of relevant knowledge and support from the local advisory service.

Lack of knowledge, and misunderstandings about ecological agriculture, are themselves social barriers. Cosmopolites are often so strongly motivated that critical questions and jokes do not depress them. More locally oriented farmers may be more sensitive to such criticism (Vartdal 1993). However, not all reactions in the local community will be negative when a farmer starts conversion. For example, local newspapers often show a very positive and supportive interest, and on all levels in society the greening has resulted in a more positive attitude towards ecological agriculture.

Latent Conflicts within the Eco-movement

One of the ways of approaching ecological agriculture may be described as "fundamentalist", advocated by the cosmopolites. Briefly this may be defined as "fulfilling all eco-standards is the least one should do to call oneself an eco-farmer". On the other hand, some of the reformists are less fundamentalist, and feel it is more important to bring about changes to encourage farming in general to take better care of the environment, than to maintain a very strict definition of eco-farming.

The reformists often find it difficult to present their opinions in discussions with more fundamentalist eco-farmers. The cosmopolites, on the other hand, state that open and interesting discussion of personal opinions is one of the important strengths of the eco-movement. According to Vartdal this conflict makes it difficult for the eco-movement to create a consensus about what a conversion is or should be.

The difficulty of being accepted by experienced eco-farmers forms an important social barrier for many reformists, who give up the process of further conversion (Vartdal 1993).

Conclusion: The Spread of Ecological Agriculture

Fulfilling the standards of ecological farming is the basis for the official conversion subsidy in Norway. This is fortunate because it keeps the eco-movement together. However, if the intention of this subsidy is to stimulate an environmentally sound agriculture, one may ask if more farmers would change their practice if they received the subsidy on a basis of less strictly defined standards.

Vartdal suggests that the fundamentalist eco-farming will spread in a certain social network (the eco-movement), whereas a less strictly defined half-way eco-farming can spread among locally oriented farmers without close contact with the eco-movement.

A locally oriented eco-farmer has an important function to show the neighbours that ecological agriculture is not necessarily a "weedy low-yield chaos". Hence, reformists become important pioneers as well. The further diffusion of ecological agriculture may be dependent on reformists as the local inspiration for conventional farmers.

The cosmopolites contribute efficiently by informing public opinion and the Government about ecological agriculture, and hence contribute to the greening of society. As Fostvedt (1993) points, some of the commitment to change society very rapidly, which characterised the eco-movement in the "green seventies" has been lost. Instead, the eco-farmer in the nineties tries to realise his or her vision of the good life on a smaller scale. For instance, they run farm shops, combine farm and social work etc.

Ecological agriculture has a very positive influence on agriculture in general. The future diffusion of this farming practice will depend on whether the eco-movement is willing to accept conversion as a social process as much as a process of agronomy, and to work to overcome the social barriers against conversion found here.

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3. Having a 'vision' of what the farm will be like after conversion.
4. Describing each year of the conversion period with special attention to the conversion of soil and plant production, necessary husbandry changes and investments.
5. Revising the plan according to the experiences and results obtained.

Ecological Milk Production

On most Norwegian dairy farms the production of feed concentrates is not possible due to climatic restrictions. Hence, the upper limit of 20 per cent conventional fodder in the national standards for ecological fodder rations often represents the upper limit of feed concentrate used in ecological dairy production.

Ecological milk production was compared to that of conventional farms. Results showed that feed rations for dairy cattle on converted farms were more varied than on conventional farms, containing less concentrate, more grazing, more hay and less silage. Spring calving dominates in ecological dairy production, explaining, to some extent, the difference in grazing, which constitutes 33 per cent of the energy content in the fodder ration on converted farms versus 14 per cent on conventional farms. The amount of concentrate varied from 1 per cent to 24 per cent of the energy content in the fodder ration on converted farms, whereas the amount of concentrate in conventional production averages 38 per cent.

Milk yields on the conventional farms varied from 3,300 to 5,350 kg per cow per year, closely related to how much concentrate the cows received. The average milk yield in Norway was 6,304 kg in 1992, based on rations with 38 per cent concentrate.

The average fertility score for the cows on converted farms was medium to high. Mean age of cows on converted farms was calculated to 5.5 years, whereas the mean age of cows recorded in the national herd in 1992 was 4 years. The percentage of cows treated for ketosis, milk fever and clinical mastitis is shown in table one. The results indicate the better health of cows in ecological milk production.

Table 1

Percentage of cows treated for ketosis, milk fever and clinical mastitis on organic farms compared to the Norwegian average for cows giving the same milk yields (middle of four years).

Illness	Organic	Conventional
Ketosis	1.7	11.1
Milk fever	0.7	3.0
Clinical mastitis	5.1	17.9

A high content of roughage in the fodder ration was negatively correlated with veterinary treatments ($P < 0.05$). This together with a satisfying protein content in the milk (3.19 per cent), indicated that the supply of energy and protein in the diets was satisfactory.

Plant Production

Roughage yields on ecological and converting farms were found to be on average 10 per cent below conventional farms located in the same district.

Nitrogen supplies on ecological farms were about 50 per cent of the amounts (measured as total nitrogen content in

'Thirty-farm Project' - Norway

A study of ecological production on 32 Norwegian farms was carried out from 1989-1992 by the Norwegian Centre for Ecological Agriculture. The farms were predominantly dairy and 21 were in the process of conversion.

Detailed data collected throughout the four year study period, thanks to full farmers' co-operation, included: date and amounts of seed and manure use; harvests; rainfall; roughage stocked as silage; daily food intake and roughage analysis, recorded once a month for dairy cattle and sheep; yield of grass, green fodder, grains, potatoes and some vegetables, on approximately 30 per cent of field area; analysis of grass samples for energy, protein and dry matter content; soil nutrient analysis; data on economics; and input and outputs of nutrients.

Conversion Plans

Helping farmers plan the conversion process was an important part of the project, and a 5 step method for conversion planning was established.

1. Describing the situation on the farm when conversion starts.
2. Analysing the farmers' goals and motivation.

animal manure) normally used in conventional fodder production. There was less manure available on totally converted than on converting farms, and yields on converted farms were on average 10 per cent lower than on converting farms.

Farm gate nutrient balances showed that ecological farming practices clearly improve nutrient management, compared to conventional agriculture. On converted farms, the amount of nutrient exported in sold products was balanced by the amount of nutrients imported onto the farm. Farms in conversion reduced the surplus of nitrogen, phosphorus and potassium by about 50 per cent compared to the situation before conversion by avoiding purchased fertiliser, but still using average amounts of purchased concentrates.

Meat and dairy farms export less nutrients per hectare than farms selling grain, potatoes and vegetables. Potassium balances, in particular, may easily become negative when large amount of potatoes and vegetables are sold. In regions with small potassium reserves in the soil it may be necessary to supply potassium fertilisers to maintain a specialised plant production operation.

Conclusions

The results indicate that ecological milk production in Norway may be environmentally sounder than conventional systems due to the reduced potential for environmental pollution, more efficient nutrient utilisation and improved health and longevity of the cows.

The 'Thirty-farm project' is to be followed by another four year project (1993-96) - *'Agronomy and economy in ecological agriculture - 13 case studies'*.

Source: Based on a paper from Anne-Kristin Løes of the Norwegian Centre for Ecological Agriculture. Further details of the research and published papers can be obtained from the Centre.