GROWING FOR THE FUTURE II

Unilever and sustainable agriculture

Unilever

Contents

Message from the Chairmen

Since the mid-1990s Unilever has been consulting with experts and engaging with suppliers, customers, consumers and business partners to find a sustainable way forward for agriculture.

As one of the largest consumer goods companies in the world we are highly dependent on agricultural raw materials, such as tea, vegetables and vegetable oils, and therefore on the future of agriculture. This has led us to develop the sustainable agriculture initiative.

In 1999 we published our first booklet on our approach and the initial results. This second booklet reports our progress, the richness of the learnings and the challenges ahead.

We have experienced a growing interest and willingness to participate in finding ways to make agriculture more sustainable. However, a dramatic acceleration of efforts to develop more sustainable practices is still required. We still face many issues with an adverse affect on farm productivity. For agriculture to become truly sustainable and able to feed fast-growing populations, matters such as soil fertility, biodiversity, water resources and the quality of rural life must be addressed.

We believe there needs to be a greater diversity of approaches to farm and plantation management. All agricultural systems have something to offer, and we want to find out what works best in different local circumstances.

Our earlier experience on fisheries has confirmed our belief that market mechanisms offer the way forward in the long term. They can stimulate performance improvement and efficiency along the supply chain

and raise quality standards to meet consumer needs and expectations.

Ultimately we want the market to work for sustainable development and to encourage fully sustainable agricultural systems. We wish to contribute to this development and benefit from it.

We are starting to make progress on this long journey, but we need the continued help of others. We are committed to engage with our stakeholders and share our work with them in our projects. We urge them to make contact if they wish to contribute in any way.

E-mail: sustainable.agriculture@unilever.com

Antony Burgmans **Niall FitzGerald**

Context

Who we are and what we do

Unilever is a truly international company, with operations in more than 90 countries spanning every continent. Unilever products fall into two main categories: home and personal care, and foods. The Unilever portfolio includes a balanced mix of local, regional and international brands that take account of the differences as well as the similarities in consumer needs worldwide. Some of our food brands are: Annapurna, Birds Eye, Bertolli, Hellmann's, Iglo, Knorr, Lipton, Magnum and Ragú.

Unilever and Agriculture

Agriculture provides more than three quarters of the raw materials for Unilever's branded goods. We are among the world's largest users of agricultural raw materials, and a major buyer of agricultural goods for processing on world markets. We process vegetable oils, such as sunflower, soy and rape seed, which are used in our spreads and dressings. We produce palm oil as well as buying it on the open market. We are one of the world's largest producers of tomato-based sauces and pastes with many growers working under contract. We use vegetables such as peas and spinach in our frozen brands.

We have been involved with farmers for many years in developing agricultural best practice guidelines. The guidelines are incorporated into our contracts with growers, and define soil preparation, fertilisation regimes, harvesting and other activities specific to each crop. Current best practice is mainly based on integrated farming principles, and involves judicious use of fertilisers and pesticides to maximise yield while minimising environmental impacts. From this basis, the sustainable agriculture initiative is a logical progression.

THE ROLE OF THE MARKET

Our ultimate objective is to create market mechanisms that favour sustainable agriculture. We plan to achieve this by working with a range of partners, starting locally, and by providing information to those who shape the market – producers, buyers, processors, consumers. We believe that if these market players understand the issues as suppliers, and their choices as responsible consumers, their influence will encourage sustainable production. Market mechanisms can stimulate improvement and the sharing of efficiencies along the supply chain to maintain competitiveness. This in turn will raise standards so that consumer needs and expectations are met.

Unilever has direct experience of such a market-based approach through the Marine Stewardship Council (MSC), established in 1998 following a Unilever/WWF joint initiative. After broad consultation the MSC compiled a set of principles and criteria for sustainable fishing. The MSC label allows consumers to choose products sourced from certified fisheries that comply with sustainability standards.

For more information see: www.msc.org and www.unilever.com – click on the links for Environment and Society: Sustainability initiatives: Fish.

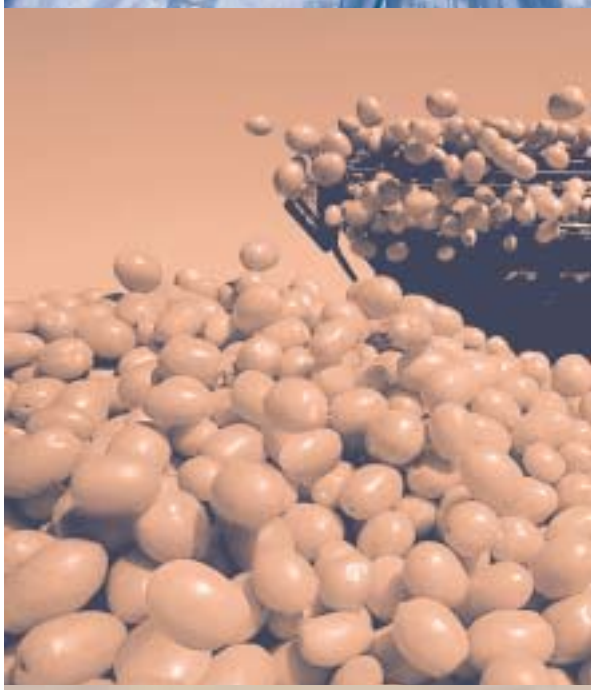
Why is sustainability important to Unilever?

The aims at the heart of our Corporate Purpose are "to meet the everyday needs of people everywhere" and to use "the highest standards of corporate behaviour towards our employees, consumers and the societies and world in which we live". We feel these goals can only be achieved in the long term if our actions are determined by the broader principles of sustainable development: ensuring we meet the needs of today without jeopardising the ability of future generations to meet their needs. This means

we must align our economic goals with the social and environmental consequences of our work.

Because we rely heavily on natural raw materials, in purely business terms, it makes sense for us to ensure their sustainable supply so that we can continue to run a prosperous and healthy company in the long term. We also have a clear obligation to our stakeholders, especially shareholders, employees and business partners, to ensure continued access to agricultural materials. Our consumers expect high quality goods produced in an environmentally and socially responsible way, and we need to ensure on their behalf these requirements are understood along the supply chain.

Our position in the market gives us some influence on how the materials are produced, and considerable social responsibility to use this influence wisely. We also believe it is the market, rather than regulation, that holds the key to progress [see box: the role of the market, p.2].



The Unilever Sustainable Agriculture Initiative

Introduction

Aims and approach

The sustainable agricultural initiative came into being in the mid-1990s. Recognising that pressures on agriculture had implications for Unilever in the long term [see box: mission statement, p.28], we began working with others to develop the programme. We also started similar initiatives for water and fisheries in response to pressures on water resources and fish stocks.

The aim of the sustainable agriculture initiative is to ensure continued access for Unilever to the key agricultural raw materials, and ultimately to develop market mechanisms that allow consumers and customers to influence the sourcing of raw materials through their buying habits.

The question we face is how farming can become more productive, protect the environment, preserve natural resources and contribute to rural communities, while using fewer agrichemicals and other inputs? It poses a huge challenge for those involved in agriculture: farmers, scientists, experts, governments and businesses.

We have chosen to focus on how to improve the sustainability of current farming methods in particular locations, and how to make the production of the crops we need sustainable. We have started to do this where we directly influence agricultural practices used, i.e. on our own plantations and where we deploy contract farming.

We realise what can be achieved at farm level is limited. Aspects of water management, biodiversity and rural development need to be addressed on a wider scale, but lie outside the scope of our current pilot projects.

Continuing the learning processes

A commitment to continuous learning and a willingness to remain open to new ideas are embedded in our corporate purpose. These are critical to the success of our initiative: the challenge of sustainable agriculture is to combine current scientific views with empirical and sometimes traditional knowledge on issues such as pest management and crop rotation.

A tradition of learning is well established within Unilever. In some cases we have been working for over 30 years with farmers to develop agricultural best practice guidelines. These are based on an integrated farming approach and aim to reduce environmental impact, ensure product quality and maximise crop yield. From this firm basis we can move towards sustainable agriculture practices. The main innovations the sustainability perspective has added come from outside the agricultural sphere - such as biodiversity and the social aspects.

Engaging people to take this process forward is essential. Those who have been involved in drawing up the best practice guidelines will contribute their

experience to the sustainability project. We also want to stimulate continuous improvement in practices and working with the farming community through participative learning. Our objective is to support suppliers in setting up self-sustaining consulting mechanisms, which will enable farmers to find solutions themselves.

We believe that sharing knowledge will prompt our industry peers to take initiatives similar to our own, which is part of our overall strategy. To kick-start our own learning process, we have consulted with experts around the world and engaged with people who have influence over our business and with our stakeholders.

MODERN AGRICULTURE - SUSTAINABLE AGRICULTURE IN CONTEXT

In the 1960s the "Green Revolution" brought a dramatic increase in food production. This form of agriculture relies on high inputs: chemical fertilisers, pesticides, water, energy.

Although food production has increased dramatically, such intensive agricultural practices do not appear to offer a sustainable future either for agriculture or for society's capacity to feed itself. Indeed, hunger and poverty still exist, and the environmental pressures following the Green Revolution could be damaging. Concern is further heightened by increasing interest among consumers in food safety, production methods, and their environmental impacts – such as the destruction of natural habitats and the effects of agrichemicals on wildlife – as well as human health. Also, many consumers want local communities to have a fair share in the economic benefits from the food they produce.

These concerns, combined with the global debate on sustainable development, have led to renewed interest in the future of agriculture. The debate centres on the best methods to feed fast-rising populations and ensure regular supplies of agricultural goods. Meanwhile, technological advances allow more precise monitoring. Recent years have also seen two significant developments: the advent of biotechnology, and a rapidly growing demand for organic food [see box: biotech and organic farming, p.7].

Given the central role that agriculture plays in many societies, its history and deep cultural and political significance, the debate requires a holistic approach, taking into account social values as well as science.

The project

Establishing the basics

In 1995 we commissioned a study which provided the foundations for our current approach. It captured the opinions of leading players and opinion formers among consumers, farmers, agribusinesses, the food industry, retailers and non-government organisations (NGOs) with an interest in the environment and sustainable development.

A workshop in 1998 drew participants worldwide from within the company and among agricultural experts from academia. We have, in particular, benefited from the support of Professor Jules Pretty of the University of Essex, UK.

The workshop was a milestone in the sustainable agricultural initiative, and its outputs have shaped the project. These were:

- The development of a mission statement [see box: mission statement, p.28], including a definition of sustainable agriculture
- The definition of four principles of sustainable agriculture
- Identification of 10 broad indicators of sustainability in agriculture [see box: sustainable agriculture indicators, p.11]
- Choice of five crops – oil palm, tea, tomatoes, spinach and peas – which are significant to Unilever and where we have a direct influence on agriculture.

With these foundations in place we have made progress. Each of the five key crops is being tested in pilot projects. We are now broadening the scope to include other crops. We have also established three groups to provide a framework for the learning process.

- The Sustainable Agriculture Advisory Board – to provide independent expertise, direction and judgement
- The Sustainable Agriculture Steering Group – with responsibility for the coordination and implementation of the process
- Four Consultative Groups – to look at markets and supply chains for specific food groups

The following sections show how each group will help Unilever move towards its objectives.

The framework

Advisory Board

The Sustainable Agriculture Advisory Board (SAAB) provides independent advice and judgement and strengthens policy making within Unilever. Its principal objectives are the improvement of environmental impact of primary production, safeguarding social infrastructure and well-being for stakeholders. Profit and continuity are also important aims.

Membership of the SAAB comprises individuals from research institutes in the voluntary sector and academia. Members are selected for their individual quality, rather than to represent their organisations.

SAAB's role encompasses a number of key functions. Members advise on the overall approach of the sustainable agriculture initiative, including aspects of primary production processes, land use, chain management and consumer interests. They advise on sustainable standards for Unilever's selected key crops, as well as how to make these standards acceptable to stakeholders.

BIOTECH AND ORGANIC FARMING

The issues

Biotechnology **(often referred to as genetic modification) involves the manipulation of the genes of existing organisms to develop new strains. Campaigners are concerned about the effects that genetically modified organisms (GMOs) will have on the environment – particularly the contamination of other plants through cross-pollination – and the safety of food containing GM ingredients.**

Organic farming **excludes the use of genetically modified organisms and restricts, or prohibits, the use of artificial fertilisers or pesticides, preferring more natural alternatives. As organic certification requires that products are grown without the use of GMOs, many growers fear that contamination from GM crops threatens the future of their business, and some would argue that the two systems cannot exist side by side. Critics of organic farming argue that it cannot supply sufficient quantities of food for a growing population.**

Unilever's position

We believe that the future of agriculture needs to be sustainable. Our approach is to keep an open mind on the role that organic farming and biotechnology could play in the context of sustainable agriculture.

Many techniques and approaches used in *organic farming* **focus on the underlying health and vitality of agricultural systems, and will meet our standards in social, economic and environmental terms. Indeed, they have a vital role in sustainable agriculture.**

Similarly, we feel that some applications of *biotechnology* **offer real social, economic and environmental benefits. If biotechnology is to find a place within our vision of sustainable agriculture it must conform to the four principles set out in our mission statement. We will need to be satisfied that it is environmentally safe. If after careful evaluation against our standards this proves to be the case, then we would consider biotechnology could contribute to sustainable agriculture.**

Understanding the concerns of our consumers is of paramount importance to us, because our business success depends on it. Our research shows that some of our consumers have strong opinions about biotechnology and organic farming, and we will continue to respond to demands in our different local markets to provide products that meet consumers' expressed needs.

It is essential that consumers should have the information they need to choose the food they wish to buy. Labelling standards are important, and we will continue to work with the relevant authorities and those in our industry to ensure that labelling is clear, informative and fair. Furthermore, the public and our consumers must have full confidence in the regulations that govern the development and use of biotechnology by industry.

We will continue to work on our own and with others to track developments in the science and in public opinion, and remain committed to full participation in the debate on the use of genetic modification in food production. We will retain the capability to include GM ingredients in our food products in the future when these are shown to be safe, are approved by the relevant authorities and are wanted by consumers.

More information on www.unilever.com – click on the links for Environment and Society: Responding to global issues: GMOs.

SAAB's other main function is to establish links with other bodies working in the sustainability field, e.g., on agricultural research, water management, biodiversity see box: SAAB members, p.8-9].

Steering Group

The Sustainable Agricultural Steering Group (SASG) comprising Unilever staff is responsible for managing the initiative. Its objective is to promote sustainable supply chains worldwide, focusing on Unilever's long-term, sustainable access to the key crops. Jules Pretty acts as advisor [see box: SAAB members].

Progress is mapped out in three phases:

- sustainable agriculture best practice in growing key crops
- sustainable agriculture standards for sourcing key crops and developing a sustainable supply chain
- establishing market mechanisms that enable Unilever to source products from sustainable agriculture.

Progress must be measured. Clear objectives, milestones and performance indicators are built in to each phase.

Consultative groups

The consultative groups consider the four strategic food groups: oils (includes rape seed and palm oil), tea, tomatoes, and vegetables (spinach and peas).

Their role is to assess the world market and supply chains, and establish market mechanisms that enable Unilever to source materials from sustainable suppliers.

SAAB MEMBERS

Janet Barber

United Kingdom

Janet Barber has national and international experience in planning and implementing public policy and field programmes designed to achieve the socially and environmentally sustainable use of natural resources and analysing the effectiveness of investments. She has worked with Forum for the Future (UK), WWF, and other NGOs and international companies.

Hartmut Bossel – University of Kassel, Germany (retired)

Germany

Dr. Bossel has led research projects and studies on energy supply policy, global dynamics, agricultural policy, forest dynamics and management, sustainable development and indicator systems. Before his retirement in 1997 he was professor of environmental systems analysis and director of the Scientific Center for Environmental Systems Research at the University of Kassel.

Barbara Dinham – Pesticides Action Network UK (PAN UK)

United Kingdom

Barbara Dinham is Programme Director of PAN UK, an independent charity addressing the health and environmental problems of pesticides. PAN UK works to eliminate the hazards of pesticides through a range of programmes, and is part of the worldwide Pesticide Action Network.

Amadou Diop – Technical Director, Rodale Institute

USA

Dr. Diop works on Rodale Institute programmes, which focus on education and extension of regenerative farming practices to young farmers. The Institute works with people worldwide to achieve a regenerative food system that renews environmental and human health, and aims to develop awareness of the importance of healthy soil.

Bernward Geier – Executive Director for External Affairs, International Federation of Organic Agriculture Movements (IFOAM)

Germany

Bernward Geier is responsible for IFOAM's lobbying, outreach, editing and press-related activities. IFOAM represents the worldwide movement of organic agriculture, providing a platform for global co-operation. It is committed to a holistic approach in the development of organic farming systems including maintenance of a sustainable environment and respect for the needs of humanity.

Anne-Marie Izac – Director of Research, International Centre for Research on Agroforestry (ICRAF)

Kenya

Dr. Izac's research interests combine ecology, economics and natural resources management. She has worked within CGIAR[1] for 11 years. ICRAF aims to improve human welfare by alleviating poverty, improving food and nutritional security and enhancing environmental resilience in the tropics. It focuses on soil fertility and conservation, biological diversity, sequestering carbon and reducing greenhouse gas emissions.

Richard Perkins – World Wildlife Fund United Kingdom (WWF-UK)

United Kingdom

Richard Perkins is involved with UK and international research and advocacy projects on the environmental impact of food, farming, rural development, and agricultural trade at WWF. He is also a member of international NGO networks addressing food, sustainable agriculture and rural development.

Per Pinstrup-Andersen – Director, International Food Policy Research Institute (IFPRI)

USA

Dr. Pinstrup-Anderson has expertise in agricultural science and technology and was formerly director of the Food and Nutrition Policy Program at Cornell University, New York. IFPRI works to help developing countries devise appropriate food policies and policies to ensure the optimum use of new agricultural technologies. It aims to foster sustainable economic growth and combat poverty through better government policies.

Jules Pretty – University of Essex

United Kingdom

Prof. Pretty is Director of the Centre for Environment and Society, University of Essex, and was formerly Director of the Sustainable Agriculture Programme of the International Institute for Environment and Development in London. He has authored several books on sustainable agriculture. Mr. Pretty is associated with the Forum for the Future in the UK. He is advisor to the SASG.

Rudy Rabbinge – University of Wageningen

The Netherlands

Prof. Rabbinge's main teaching subject is principles of production ecology. His research projects cover: yield potentials of energy crops under various land use options; integrated cropping systems; sustainable land use and food security in developing countries; and work on land use, yield, ecologically sound pest control and knowledge transfer.

Bernard Tinker – Oxford University (retired)

United Kingdom

Dr. Tinker is a soil scientist with expertise in oil palm production. He is consultant to a Malaysian plantation group. Other roles include adviser to Palm Oil Research Institute of Malaysia, head of the soils department at the Institute of Arable Crops Research, UK, and a director with the Natural Environment Research Council.

[1] *CGIAR - Consultative Group on International Agricultural Research - is a worldwide network of institutions that seek to improve the productivity of agriculture, forestry, and fisheries in developing countries, reduce malnutrition, and enhance the well-being of poor people while preserving their environment. ICRAF, IFPRI and International Rice Research Institute operate within CGIAR.*

The field work

Sustainable Agriculture Indicators

Establishing the 10 indicators in the 1998 workshop was a major first step in defining criteria for sustainable agriculture [See box: sustainable agriculture indicators, p11]. The choice of indicators focuses on physical aspects first: agriculture must be sustainable from an ecological point of view. Social and economic elements can only follow if this requirement has been met.

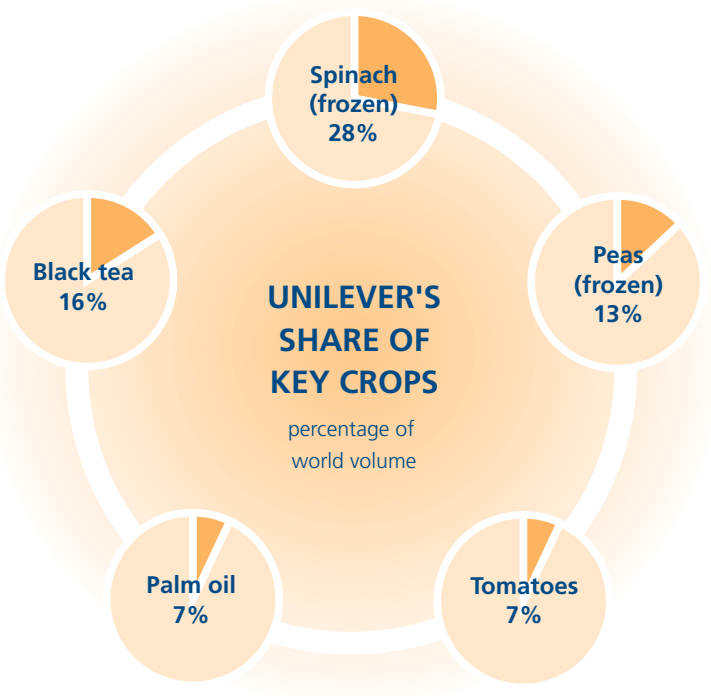
Within each broad indicator specific, measurable parameters are defined. Local situations and the type of crop will make it necessary to give local definitions to some parameters; others are common to all pilot projects. Monitoring makes the impact of farm practices on the environment, economy and society more transparent.

The pilot projects – testing out the theory

Each project has defined its parameters, following the 10 indicators. All have involved local growers and planters, local NGOs, research institutes and sometimes community groups. The first two years or so establish the baseline: the impact of current agricultural best practices on environment, economy and social conditions, as measured through the parameters.

The next step is to improve practices and push parameter values to a more sustainable level. Discussions with stakeholders are important to reach agreement on what constitutes a "more sustainable" level. Once changes are made, the effect on the parameter values is monitored. If the parameter values move in the right direction, then the new practices become part of the sustainable agriculture standard. If the values do not change, or move in the wrong direction, then either the wrong practice was changed, or the right practice was changed in the wrong way, or the parameter value chosen was not correct after all. It is a process of trial and error.

The following pages describe where the various pilot projects are in this process.



SUSTAINABLE AGRICULTURE INDICATORS

1 Soil fertility/health

Soil is fundamental to agricultural systems, and a rich soil ecosystem contributes to crop and livestock performance. Sustainable practices can improve beneficial components of the soil's ecosystem.

Parameters: • Number of beneficial organisms (e.g., earth worms per square meter) • Number of predatory mites • Number of beneficial micro-organisms • Soil organic carbon (measure of healthy soil structure)

2 Soil loss

Soil eroded by water and wind can lose both structure and organic matter, diminishing the assets of an agricultural system. Sustainable practices can reduce soil erosion.

Parameters: • Soil cover index (proportion of time soil is covered with crop; protects against leaching and erosion, promotes water binding) • Soil erosion (loss of top soil in percentage per annum or in t/ha/annum)

3 Nutrients

Crops and livestock need a balance of nutrients. Some of these can be created locally (e.g. nitrogen), and some must be imported. Nutrients are lost through cropping, erosion and emissions to the air. Sustainable practices can enhance locally produced nutrients and reduce losses.

Parameters: • Amount of inorganic Nitrogen (N)/ Phosphates (P)/ Potassium (K) applied (per ha or per tonne of product) • Proportion of N fixed on site/imported • Balance of N/P/K over crop rotations • Emissions of N-compounds to air

4 Pest management

When pesticides are applied to crops or livestock, a small but significant proportion can escape to water and air or accumulate in foods, affecting ecosystems and human health. Sustainable practices can substitute natural controls for some pesticides, reducing dependence on synthetic substances.

Parameters: • Amount of pesticides (active ingredient) applied (per ha or per tonne of product) • Type applied (profiling, positive list, weighting factor) • Percentage of crop under Integrated Pest Management (IPM)

5 Biodiversity

Agriculture has shaped most ecosystems in the world, and biodiversity can be improved or reduced by agricultural practices. Some biodiversity is highly beneficial for agriculture. Sustainable practices can improve biodiversity - by 'greening the middle' of fields as well as `greening the edge'.

Parameters: • Level of biodiversity on site: number of species (e.g., birds, butterflies); farm landscape; habitat for natural predator systems (e.g., hedgerows, ponds, non-cropped areas) • Level of biodiversity off-site: cross-boundary effects

6 Product value

Product value is a measure of the desired outputs of an agricultural system. Sustainable practices should be able to maintain or improve product value.

Parameters: • Total value of produce per ha • Yield of target product in tonnes per ha • Conformancy to quality specifications: nutritional value, including minerals; pesticide residues; foreign bodies, etc. • Ratio of solid waste re-used/recycled over solid waste disposed to landfill

7 Energy

Although the energy of sunlight is a fundamental input to agriculture, the energy balance of agricultural systems depends on the additional energy supplied from non-renewable sources to power machinery. Sustainable practices can improve the energy balance and ensure that it remains positive - there is more energy coming out than going in.

Parameters: • Balance: total energy input/total energy output, including transport where relevant • Ratio renewable over non-renewable energy inputs • Emissions to air (greenhouse and pollutant gases)

8 Water

Some agricultural systems make use of water for irrigation, some pollute or contaminate ground or surface water with pesticides, nutrients or soil. Sustainable practices can make targeted use of inputs, and reduce losses.

Parameters: • Amount of water used per ha or tonne of product for irrigation • Leaching and runoff of pesticides to surface and ground water • Leaching and runoff of N/P/K (nutrients) to surface and ground water

9 Social/human capital

The challenge of using natural resources sustainably is fundamentally a social one. It requires collective action, the sharing of new knowledge and continuous innovation. Sustainable agriculture practices can improve both social and human capital in order to ensure normal outputs. The prime responsibility for this should remain with the local community, leading to realistic and actionable targets.

Parameters: • Group dynamics/organisational density (farmer groups) • (Rural) community awareness of relevance and benefits of sustainable practices/connectivity to society at large • Rate of innovation

10 Local economy

Agricultural inputs (goods, labour, services) can be sourced from many places, but when they come from the local economy, the expenditure helps to sustain local businesses and livelihoods. Sustainable agriculture practices can help to make the best use of local and available resources in order to increase efficiency.

Parameters: • Amount of money/profit reinvested locally • Percentage of goods/labour/services sourced locally • Employment level in local community

Pilot Projects

PROJECT PROFILE: COLWORTH FARM RESEARCH CENTRE
Operating company
Unilever Research Laboratory Colworth
Scope
1 farm, 8 fields in a 1 in 7 year rotation, 60 ha
Team
Core team of 3, farm team of 4 including one agronomist
Crops
Winter wheat, spring wheat, winter oilseed rape, vining peas, set aside
Project start date
September 1999

Colworth is representative of an east England arable farm. It is principally a research centre and its produce is not used in Unilever foods. This allows greater flexibility to experiment. The project investigates factors that can be directly influenced – rotation, minimal tillage, time of crop (winter versus spring), fertilisers, pesticides.

The team works with a range of partners including - wildlife organisations, academics and scientists - and has consulted with other stakeholders.

What we've been doing

The project has monitored losses of nitrates, phosphates and pesticides for two seasons and now has a unique data set as a baseline. The sustainable treatments for pesticides and fertilisers are managed to achieve a target of zero environmental impact.

What we've learnt

Minimal cultivation has improved soil structure and alleviated compaction. Flower margins and pheromones[2] have encouraged beneficial insects that control pests, simultaneously increasing biodiversity, especially winter bird life. Crops with zero pesticide treatments also appear more attractive to birds. Leaching of pesticides has not been detected where low, curative applications have been used. Using synthetic nitrogen without herbicides significantly increased the number, but not diversity, of weeds. Satellite yield mapping accurately records the effects of different treatments.

[2] *Insect sex hormones. Pheromone traps are used to confuse insects or trap them, reducing mating.*

Challenges

Is it possible to maintain quality and yield with significantly reduced levels of synthetic nitrogen? In trials, overall yield was reduced, but the challenge is to achieve at least an equal gross margin compared to conventional farming practice. The generation of local markets is key to adding value to products.

Can the increase in biodiversity be maintained? While the project is delivering some benefits to growers, will these be enough to persuade farmers to change practices?

Next steps

A cost model to improve understanding of the implications of changing to sustainable agriculture will address farmers' questions about costs and benefits, particularly concerns that more sustainable practices will compromise yield, quality and commercial viability. It will be key to understanding the impact of such changes on the value of the supply chain.

At Colworth the model is used to examine the effects of cutting fertiliser and pesticide inputs by more than 75% and the potential increased risk. The model will also compare the costs of reduced inputs with the price of clean up associated with high-input practices – a key issue in the debate on agricultural subsidies in Europe.

Palm Oil

Product profile

Palm oil is produced from the fruit of the oil palm, a tropical tree grown mainly in East Asia, West Africa and South America. Unilever owns plantations in Malaysia and West Africa. Well-managed plantations can be highly sustainable – they need fewer inputs, result in less pollution and soil degradation and create more rural employment than other vegetable oils [see box:

RAINFOREST DESTRUCTION AND PALM OIL PRODUCTION

The issue

Globally there are over 10 million hectares of oil palm plantation. Production has doubled over the last decade to 23 million tonnes.[3] In some countries, such as Indonesia and Malaysia, rainforests are still cleared for plantations, destroying an important habitat for many species, including endangered species. In Indonesia the conversion of land is now the biggest threat to tropical rainforests alongside illegal logging.[4]

Although only 10 % of the area cleared in the last decade was planted with oil palm, many people consider rainforest destruction the key challenge to the sustainability of palm oil production.

Unilever's position

In our Pamol Plantations in Malaysia two conservation areas are maintained where a flora and fauna inventory has been completed.

The Unilever Plantations Ecological Charter defines responsible environmental practices. The charter states that we will not clear primary rainforest to plant crops. We aim to source palm oil from sustainable suppliers in the long term. Criteria still need to be defined and agreed, but will include standards for plantation management, as well as how and when the plantation was established.

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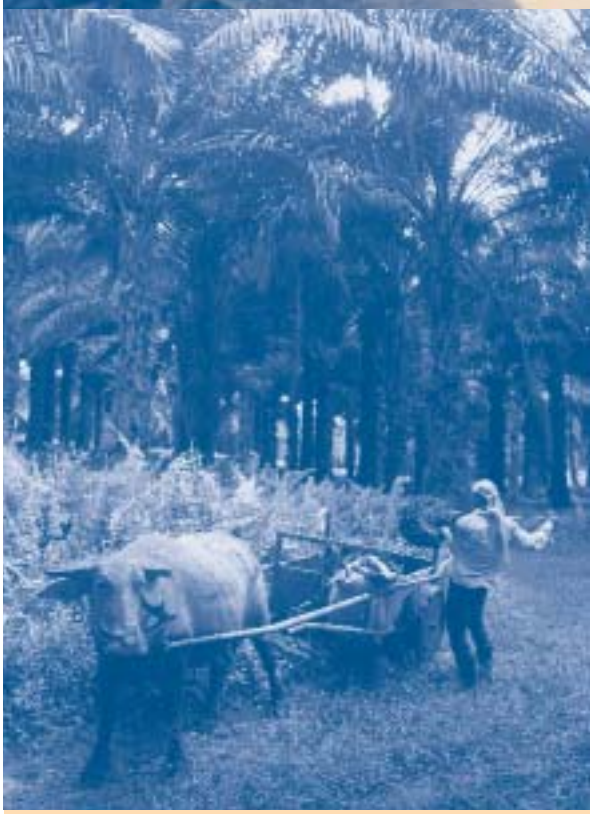
[3] *Source: WWF press release, 22 January 2002: "WWF welcomes a European first in ecologically friendly palm oil"*

[4] *Source: WWF*

rainforest destruction and palm oil production, p.13]. Palm oil has been consumed for more than 5,000 years. It is an excellent natural ingredient, and important for Unilever. Its unique properties make it suitable for use in many everyday products, such as margarine and soaps. We buy 6-8% of total world palm oil production – over one million tonnes – every year, mostly from Indonesia and Malaysia.



PALM OIL – MALAYSIA

PROJECT PROFILE: PALM OIL – MALAYSIA
Operating company
Pamol Plantations Sdn Bhd
Scope
20,234 ha
Team
Project leader plus 10 team members with responsibility for each of the SA indicators
Project start date
1999

The Malaysian team is developing an approach that could suit a range of producers. The team identified parameters for the 10 indicators during 1999. The main stakeholders have been international and local research institutes and industry associations.

What we've been doing

All organic materials are recycled to improve soil fertility and reduce inputs of synthetic fertiliser.

Draught animals, rather than tractors, are used to reduce compaction on soft ground. Terracing of steep slopes and silt pits minimises erosion. Sowing ground cover prevents soil loss, and fixes nitrogen. Natural predators are encouraged, water is routinely tested, a collection of genetic materials maintains crop biodiversity.

What we've learnt

Energy efficiency has improved since boiler operations now use mill fibre and shell waste as fuel. New housing has brought social benefits, and sourcing machinery from local suppliers helps the local economy.

Challenges

Incentives for growers to change practices to improve sustainability are unclear, and will need to be weighed up against potential increases in costs.

Next steps

The project will continue to define, implement and communicate a system of sustainable oil palm agriculture. The team is in continuous dialogue with other producers and will evaluate the sustainability of palm oil production in comparison with other major vegetable oils. A study of the total water catchment area is planned.

PALM OIL – GHANA

PROJECT PROFILE: PALM OIL – GHANA
Operating company
Benso Oil Palm Plantations
Scope
One plantation over 4,507 ha
Team
The Managing Director and Estate Manager, with engineering and other skills brought in as required.
Project start date
2001

The project builds on the work of the Malaysian pilot. Many practices are already considered sustainable, and while improvements are being made, no obstacles are anticipated in the transition to sustainable practices.

What we've been doing

Measures to prevent soil erosion include sowing cover crops as land is cleared, using factory effluent as a fertiliser supplement over 22ha, and mulching empty palm fronds for young plantings on new terraces.

Routine monitoring means chemicals are only used when disease is detected. Attention is paid to water conservation and quality, with irrigation confined to the nursery from where run-off is fed into surrounding fields. Water quality is checked quarterly. Transport is the main use of energy in the field. Energy in the factory is produced by burning biomass, fibre and shells.

What we've learnt

Nursery bags are filled with 80% composted Empty Fruit Bunch to replace topsoil. This is an improvement in terms of soil protection; the aim is to reduce the proportion of topsoil to 10% by 2002. Effects and impacts of practices are now being measured.

Challenges

The biodiversity, social/human capital and local economy indicators still need to be addressed.

Next steps

Plans to extend terracing on slopes during replanting will improve soil, water conservation and yield. The team is building stakeholder involvement with specialists comparing the nutrients in the plantation and adjoining areas. The project is now engaging third party farmers.

Tea

Product profile

Unilever is the world's largest supplier of black leaf tea, with yearly sales of around 320,000 tonnes, which accounts for 16 % of world volume of black leaf tea. Lipton is our best known brand. We own tea estates in India and East Africa and additional quantities are purchased at auctions and from third party growers. Pilot projects are established in Kenya, India and Tanzania.

TEA – KENYA

PROJECT PROFILE: TEA – KENYA
Operating company
Brooke Bond Kenya
Scope
8,036ha mature plantation and 233 immature. 13,975 permanent employees. Sales Volume for 2001 is 34,907 tonnes of made tea (including out-growers)
Team
10 team members
Project start date
1999

A blueprint for sustainable agricultural practices has been defined. Stakeholder input comes from employees, local communities, national and international research institutions including ICRAF.

What we've been doing

Levels of organic matter are well maintained. Natural biological methods control pests and diseases – no pesticides are used on mature plants except for one herbicide on field edges. Over 10% of the plantation is kept as riverine forest strips and conservation areas support natural diversity. The estate generates most of its energy needs from plantation fuel wood and hydro-electricity.

What we've learnt

Tea growing in Kenya has inherited sustainable systems, thanks to the environmental foresight of the pioneer tea planters and ideal growing conditions. The project has focused on documenting sustainability indicators and fine-tuning best practices for continued improvement. Areas of concern are:

- soil pH is declining in old fields due to continued use of acidifying inorganic fertilisers
- emissions of sulphur oxides from factory boilers
- importing farm machinery, fuel and fertilisers gives a poor performance on the local economy indicator
- smallholders need a simpler blueprint.

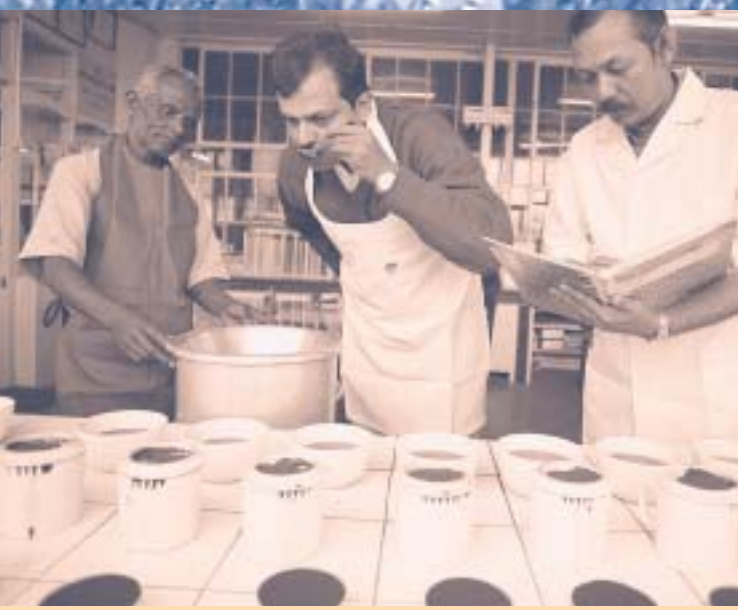
Challenges

Incidence of HIV/AIDS among agricultural workers is a serious problem. Persuading smallholders (farms under 20ha) of the benefits of sustainable agriculture is a struggle, because of low levels of literacy and numeracy. Developing user-friendly parameters for biodiversity and the human and social capital indicators is challenging.

Next steps

The team will:

- develop strategies to address areas that are lowering the sustainability performance
- customise the blueprint content to the needs of smallholders
- develop simple brochures with images illustrating sustainability and its benefits
- rollout the initiative to other smallholders.



TEA - INDIA

PROJECT PROFILE: TEA - INDIA
Operating company
Hindustan Lever Limited (HLL), Plantations division
Scope
3 plantations: Doom Dooma India (DDI) and Rossell Industries Ltd (RIL) in Assam and Tea Estates India (TEI) in South India covering a total of 9,911 ha with a sales volume of 25,766 tonnes of black leaf tea. The operating units employ 27,935 people.
Team
2 project leaders plus 3 teams of 4 (TEI), 6 (DDI) and 5 (RIL) members
Project start date
2000

HLL is involved in tea cultivation and manufacturing black tea from its plantations in Assam and South India. Around 50 small farmers have been engaged in the Assam project. Training on sustainable practices and IPM was carried out in 2000/2001, and stakeholder input is provided by a local NGO to reduce fossil fuel use. A best agriculture practices /blueprint document is being assessed by M.S. Swaminathan Research Foundation for endorsement.

What we've been doing

Prunings are retained in the field, and organic waste is converted into vermi-compost. In Assam, it is standard practice to rehabilitate soil by replanting Guatemala grass and legume crops for two years. Measures to prevent soil loss include sowing cover crops and planting field margins. In 2001, over 25,000 indigenous tree saplings were planted on the pilot sites.

What we've learnt

Synthetic fertilisers are used, but the team has reduced nitrogen input in South India over a third in

two years by including organic matter and biofertilisers and experimenting with timing and methods. The introduction of IPM has led to a reduction in pesticide use of 20-30% of 1990 levels. Biocontrol agents of fungal origin are being tested and pheromone traps are planned.

Good progress has also been made in South India in increasing renewable energy from fuel wood, from less than 20% in 1999, to 55% in 2000; in 2001 nearly all requirements for tea drying were planned to be met from fuel wood. The project has brought local social benefits too.

Challenges

The team is concerned about loss of yield or quality from a reduction in synthetic fertiliser and increased use of IPM rather than pesticides. Energy use presents challenges in terms of investments in energy efficiency, developing a renewable fuel source in Assam and, in the long term, the availability of affordable electricity. The recent drop in plantation commodity prices has to be addressed by moving the plantation products up the value chain.

TEA – TANZANIA

PROJECT PROFILE: TEA – TANZANIA
Operating company
Brooke Bond Tanzania Limited
Scope
1 Plantation, 3,025 ha, 9,400 tonnes of production
Team
Team leader plus 14 team members including estate and factory management staff
Project start date
2001

Full monitoring of the parameters took place in 2001. Stakeholders include national and international research institutes, estate employees and local communities.

What we've been doing

Tea prunings boost soil fertility. Fertiliser use has also been encouraged, with attention to minimising leakage and run-off. Herbicide application uses ultra low volume technology with spot spraying to target weeds and to ensure minimum discharge. Manual and mechanical methods are used for tea harvesting. Biodiversity is maintained along riverbanks dominated by native species and in natural forests within the plantation.

Hydro-electricity from the national grid powers almost all manufacturing operations, but irrigation relies mainly on diesel. Rain water is stored in dams to irrigate during droughts, reducing consumption from mains supplies. Nearly 400ha have been allocated to preserve water catchment areas. The company also makes significant social contributions, such as free medical facilities for employees and their dependants.

What we've learnt

The team will investigate how to minimise soil compaction in mechanised tea fields and review nursery soil importation. They will assess nitrogen and phosphate leakage and phase out toxic pesticides. A full environmental impact assessment is updated regularly.

Challenges

The unreliability of local sources of major agricultural inputs will force the company to look elsewhere in the long term. Converting to electrified systems for irrigation using renewable resources will take time and investment. The unpredictable nature of tea prices makes sustainability planning difficult.

Next steps

The team wants to involve a wider group of stakeholders and considers rollout to smallholders.

Tomatoes

Product profile

Unilever produces a range of tomato-based products, including pasta sauces and ketchup. We use about 7% of the world volume of industrially processed tomatoes. Most processing tomatoes are grown under contract by farmers in Australia, Brazil, Chile, Greece, India and the United States.

TOMATOES BRAZIL

PROJECT PROFILE: TOMATOES BRAZIL
Operating company
Unilever Bestfoods (UBF) Latin America
Scope
9 farms, 4,000 ha, 50,000 tonnes of tomatoes
Team
Seven Unilever representatives
Project start date
2000

This project started in the Rio Verde region, but after Unilever acquired a tomato operation in Goiânia it was decided to restart the project at the new site in 2002.

What we've been doing

The Rio Verde team worked with various stakeholders and defined a monitoring system based on the 10 indicators. The Goiânia project can build on this work.

What we've learnt

The sustainable approach already has been shown to achieve cost-effective production. Drip irrigation techniques saved water, contributed to higher yields and to a significant reduction in pesticide use.

Challenges

The main challenge for the Goiânia project will be to get approved and to restart as soon as possible.

Outputs in Rio Verde varied, so it is important to maintain monitoring over a number of rotation cycles, during and after the growing season.

Next steps

Once approved, the project will select dedicated growers and resume dialogue with other stakeholders such as scientific groups and NGOs.

TOMATOES AUSTRALIA

PROJECT PROFILE: TOMATOES AUSTRALIA
Operating company Unilever Australasia
Scope 5 farms, 4,404 ha, 48,290 tonnes of tomatoes
Team Three Unilever representatives working in partnership with Horticulture Australia, as well as members from the Australian Greenhouse Office, NSW Agriculture, Agriculture Victoria, Parks Victoria and Landcare Australia with Outsourced Environmental acting as facilitator and providing consultancy services.
Project start date 2000

Five representative Unilever growers are involved. Parameters and field assessment methods are defined for all selected indicators, and the farms have participated in a two-year monitoring programme.

What we've been doing

Soil analysis, IPM assessments, reviews of chemical use, water management practices, plus technologies such as soil moisture sensors, flow sensors and weather stations have assisted in data collection. An 'ecomap' gives a holistic picture of the different aspects of each field.

What we've learnt

Variations in parameters including water, pesticide and fertiliser use have been noted. Drip irrigation halves water consumption. Soil moisture sensors highlight differences in water management practices and effectiveness. Findings and plans are shared at workshops, meetings and field days.

Challenges

Water, soil fertility, and IPM are the main agricultural issues. A change in environmental performance will require education about best practices. The major challenge for the Australian industry will be its ability to invest in sustainability improvements. Can sustainable practices be adequately monitored once the project has expanded?

Next steps

The next step is to apply an environmental management system (based ISO 14001) for industry use and investigate whether changes in crop management can generate positive changes in the environment. In conjunction with joint funding partner, Horticulture Australia, Unilever Australasia are planning to roll-out the project to all Unilever growers, and eventually release findings to the wider industry.

TOMATOES CALIFORNIA

PROJECT PROFILE: TOMATOES CALIFORNIA
Operating company Unilever Bestfoods North America (UBF NA)
Scope 7 farms, 500 ha, 50,000 tonnes of tomatoes
Team Four Unilever representatives working in partnership with University of California, Davis (UCD).
Project start date 2001

This project will involve growers from all our major growing areas in California. UBF NA has signed several long-term contracts with growers currently using sustainable practices such as proper crop rotation, cover crops, water recycling, planting native habitat next to fields and grasses next to roadways.

What we've been doing

During the pilot phase the team has worked closely with a farmer committed to sustainability practices, as well as contributing to a conservation tillage crop project conducted by a UCD group comparing conventional, low-input and organic management.

What we've learnt

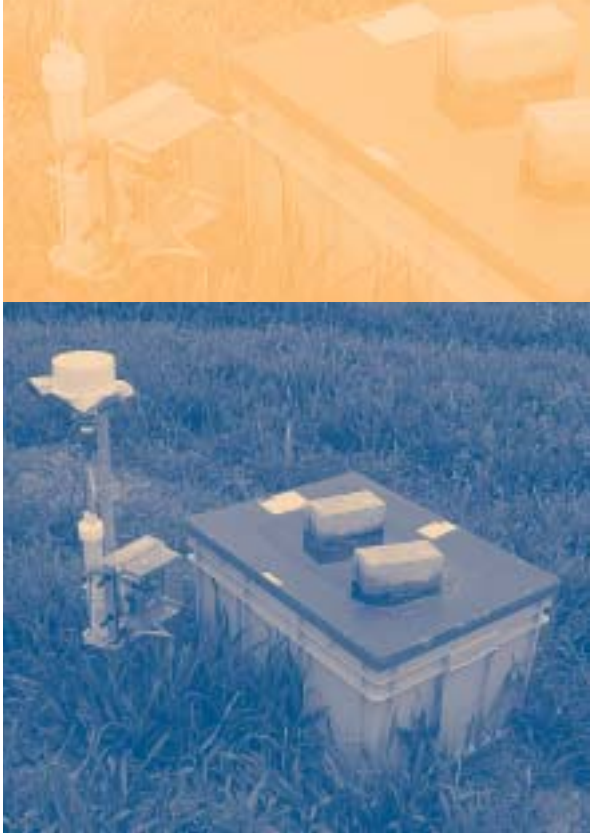
There is little communication between the government agencies and NGOs working on sustainable agricultural projects and the large production growers. A review of existing programmes will be an important step in starting an education programme with growers.

Challenges

Soil fertility and loss, water management and IPM are the main local sustainability issues. The pilot project will be built up around these indicators to inform growers of potential benefits. As with Australia, a change in environmental performance will require education about best practices. Unilever will support the UCD group's strong, effective collaboration between growers, agribusiness, researchers and farm advisors.

Next steps

An evaluation of soil biodiversity, managed by UCD, and UBF NA will support a graduate on a two-year project. In winter 2002 a model for drip irrigation will be developed. The team will also conduct a wildlife diversity study. A further priority is to set up a Californian advisory group to help form a sustainable agriculture plan for Unilever growers.



Vegetables

Product profile

Vegetable crops currently being tested are spinach and peas, used in Unilever's frozen vegetable products, mainly under the brand names of Birds Eye, Findus and Iglo. European contract growers provide around 80,000 tonnes of spinach (28 % of global) a year to our companies. We also produce over 100,000 tonnes of frozen peas per year, approximately 13% of global production of industrially processed peas.

VEGETABLES – PEAS, UNITED KINGDOM

PROJECT PROFILE: VEGETABLES – PEAS, UNITED KINGDOM
Operating company Birds Eye Wall's (BEW)
Scope 19 farms (Humberside and East Anglia), 484 ha, 2,420 tonnes of peas.
Team 7 team members, plus 15 fieldsmen and 19 growers, with input from other Unilever staff on an ad hoc basis
Project start date 1997

Most of the 19 farms involved are purely arable, though some keep pigs or cattle. Stakeholder involvement remains important. There was wide consultation at the start, participation of core stakeholders has been sustained, and a broader group – including NGOs, agrochemical companies, water companies and universities – is involved in discussions. Initial baseline research took two seasons (1999/2000). Further monitoring will continue for the duration of a full crop rotation. Parameters have been defined, and will be revised where necessary.

What we've been doing

Current practice was already good in the areas of soil fertility and health, soil loss, nutrients and energy, though further research will improve understanding and practice. Levels of nitrate, phosphate and pesticide emitted to water frequently exceeded the EU limit for drinking water, and work to gather information on this complex issue will be scaled up.

Current best practice incorporates integrated pest, crop and farm management principles. BEW has developed a process and set of criteria for profiling pesticides. It has drawn up a list of selected products and has significantly reduced pesticide use.

What we've learnt

Alternative pest control methods need further investigation. Overall biodiversity levels are low compared to ideal habitats, though peas do provide a habitat for particular bird species. Both issues will be addressed in the next phase of work:

- FIELD MARGINS – focusing on the potential of unsprayed six-metre margins around pea fields and analysis of yield maps for the last three years.

- OPTIMISATION OF INPUTS – investigating selective weeding programmes and greater use of biological controls including an aphid monitoring/warning programme using a Geographical Information Systems (GIS). A new soil sampling technique is being tested to investigate interaction between soil texture, soil water retention and pea maturity.

The team identified a lack of expertise in measuring product value and the socio-economic aspects of the indicators.

Challenges

Successful implementation of changes will depend on practical and economic considerations.

Given the size of the project, maintaining the momentum with the entire supply base is difficult and will remain a priority – a Farmers' Forum will enable an exchange of views. Also crucial is partnership with a wide range of individuals and organisations. A challenge will be to approach the research as a team so that a joint decision can be made on the direction of future work.

Next steps

The team will continue to assess new ideas, such as precision farming (using techniques like pea yield and maturity mapping, soil scanning) to stimulate innovation locally. It is also extending its dialogue with an ever-growing number of stakeholders (government, NGOs, local agronomists). A communications strategy is being developed because the success of the project depends on creating awareness and influencing stakeholders' views and behaviour.

VEGETABLES – SPINACH, GERMANY

PROJECT PROFILE: VEGETABLES – SPINACH, GERMANY
Operating company
Langnese Iglo Reken
Scope
5 farmers, 45 ha (for spinach), 45,000 tonnes of spinach
Team
11 team members
Project start date
1999

Spinach is a fast-growing crop, and can be harvested after about 40 days. Here the farmers work with Unilever fieldsmen who provide technical support, agree growing practices and select fields for spinach respecting a one-in-four years rotation. Several local stakeholders are involved.

What we've been doing

Fertiliser application is based on results of winter soil sampling. Tillage usually takes place in the spring before planting. Sowing times depend on soil moisture, and if summer soil is too dry, fields may need prior irrigation. Climatic and soil conditions influence sowing depth. Winter cover crops are recommended.

Insecticide is only used on detection of a pest, and caterpillar monitoring and control schemes are being extended. Seeds are dressed with fungicide, and both mechanical and chemical methods are used for weed control.

What we've learnt

Buffer strips of 3-6m wide are to be left along ditches and streams. Spraying of pesticides is carried out with nozzles that prevent drift, and

recommendations are made to reduce soil erosion. Intensive trials indicate that current irrigation practice is nearly optimal. Use of Bt and neem, both pesticides derived from natural materials, are being investigated, and pheromone traps are being used to monitor a species of moth (autographa gamma).

Challenges

The Reken factory is certified under ISO 9000 and ISO 14001 certification is expected in June 2002. There is currently no ISO management system standard for sustainable farming. So the Reken factory is now trying to include the sustainable agricultural practices for farmers in the factory ISO manual. The intention is that all farmers, supplying vegetables to the Reken factory, will become part of the ISO certification process. This would ensure complete certification of the whole supply chain and continuous improvement process: from farmer to end product.

Next steps

A workshop with local stakeholders and advisors in November 2001 evaluated the work so far, and the future path of the project.

VEGETABLES – SPINACH, ITALY

PROJECT PROFILE: VEGETABLES – SPINACH, ITALY
Operating company
Sagit SpA Cisterna di Latina
Scope
170 farms, 900 ha (for spinach)
Team
7 team members, including two Unilever fieldsmen
Project start date
2000

Parameters have been defined for all indicators, and monitoring took place in 2001.

What we've been doing

The farms have already seen substantial changes to agricultural practice over the past few years following a detailed review. Reforms have helped reduce inputs and costs, particularly for pest and weed control and fertilisation.

What we've learnt

The use of chemicals has been drastically reduced since 1998. Now pheromone traps help control moth populations. These measures have improved product quality by reducing the amount of foreign bodies in the spinach.

A nutrients study led to a reduction of 15% in nitrogen fertilisers and 60% in phosphate and potash. A fertiliser management tool now allows more specific field treatments.

This process of change will continue.

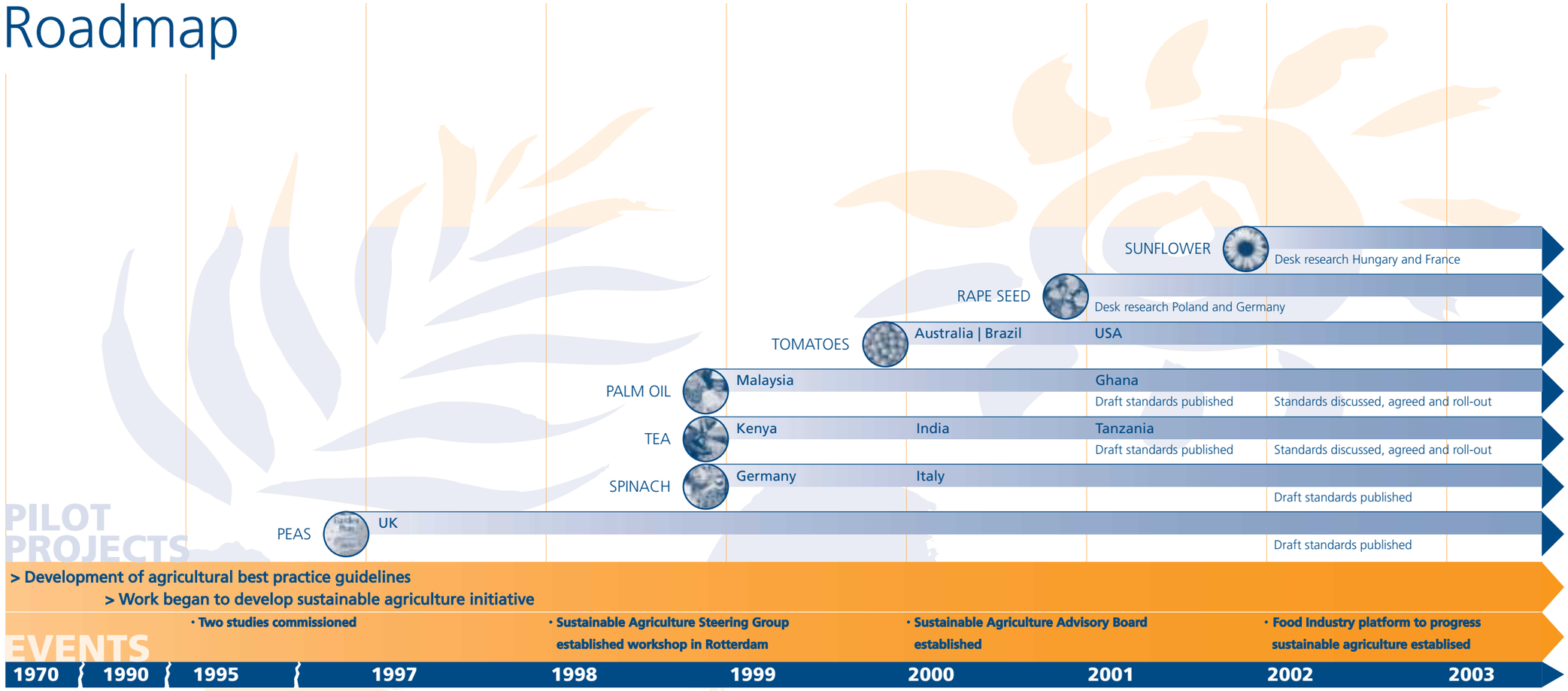
Challenges

There is still a low level of understanding of sustainable practices among farmers. The team's approach is to work with selected growers.

Next steps

So far the main advisors among possible stakeholders have been academic research institutes. The team intends to involve farming communities more closely, plus other stakeholders from all sections of the community.

Roadmap



> capturing opinions of opinion formers among consumers, farmers, agribusiness, food industry, retailers NGOs
> translating concept of sustainability into set of indicators

> development of mission statement and definition of SA
> 4 principles of SA
> 10 indicators of sustainability
> choice of five key crops

> overall approach
> standards
> stakeholder engagement

SAI: Sustainable Agriculture Initiative
> shared learning
> knowledge sharing
> open to all food industry

NEXT STEPS

Develop and validate Sustainable Agriculture Standards for use of all key crops

Contribute to necessary market mechanisms to support raw material sourcing from sustainable agriculture worldwide

Develop supply chain capable of delivering Unilever's key agricultural raw materials from sustainable sources

MISSION STATEMENT

Introduction

Our purpose in Unilever is to meet the everyday needs of people everywhere - to anticipate the aspirations of our consumers and customers and to respond creatively and competitively with branded products and services, which raise the quality of life. Agriculture provides more than two-thirds of the raw materials for those branded products. Sustainable supply of these materials represents an essential element in the long term health and prosperity of our businesses.

Agriculture is under environmental pressure for a number of reasons. There is growing competition for available land (for urban development, food and fibre production and nature conservation). Valuable arable land is also being lost through soil erosion and there is a growing shortage of fresh water in the world. Agriculture is utilising more and more water for irrigation and there is an increasing risk of pollution from nutrients (fertilisers and animal waste) and pesticides. This has prompted Unilever to develop an initiative on Sustainable Agriculture.

Unilever supports the widely held view that Sustainable Development requires alignment of economic growth, environmental protection and social progress. We have undertaken a worldwide stakeholder consultation before arriving at the following definition of Sustainable Agriculture:

Sustainable Agriculture is productive, competitive and efficient while at the same time protecting and improving the natural environment and conditions of the local communities.

Approach

Our approach to the Sustainable Development of Agriculture is to support the following principles:

- **Producing crops with high yield and nutritional quality to meet existing and future needs, while keeping resource inputs as low as possible**
- **Ensuring that any adverse effects on soil fertility, water and air quality and biodiversity from agricultural activities are minimised and positive contributions are made where possible**
- **Optimising the use of renewable resources while minimising the use of non-renewable resources**
- **Sustainable agriculture should enable local communities to protect and improve their well-being and environments**

We will propose, discuss and agree a set of indicators for Sustainable Agriculture, with a range of relevant stakeholders, to measure and improve performance of agricultural systems in order to continuously add greater value to the partners and businesses in our supply chains and to our brands. We will support and stimulate general agreement on application of superior practices through partnerships and/or independent certification of supply chains. This will be embedded in our general efforts towards free market place pricing for all inputs and outputs. In this way we will ensure that we deliver against our purpose: to add continuously to the quality of life of our consumers.

We will start by testing our ideas on a limited number of crops, strategic to Unilever, over which we can exert some direct influence.

Rotterdam, December 1998


Legend pictures

Page 3 from top to bottom:
- Nutrient efficiency: leaf sampling
- Tomato harvest
- Spinach harvesting

Page 5:
- Continuous learning: engaging people

Page 8:
- Various SAAB members during divers SAAB events

Page 9:
- SAAB members, SAAB meeting, Malaysia, April 2002

Page 12 from top to bottom:
- Biodiversity: flower margins at Colworth farm, UK
- Stakeholder consultation at Colworth farm, UK

Page 14 from top to bottom:
- Social human capital: mosque on the PAMOL plantation, Malaysia
- Soil health: draught animals to prevent soil compaction, Malaysia
- Soil loss: soil loss prevention by terraces, Ghana

Page 17 from top to bottom:
- Local economy: tea harvesting, India
- Product value: tea tasting, India
- Energy: hydro-electricity from power dam, Kenya

Page 18:
- Biodiversity: tea plants and forest, Tanzania

Page 21 from top to bottom:
- Water: drip irrigation, Australia
- Product value: tomatoes, Brazil

Page 22:
- Pest management: pest monitoring, UK

Page 24 from top to bottom:
- Product value: spinach harvesting, Italy
- Pest management: pheromone trap, Germany
- Biodiversity: buffer strips, Germany

Page 28 from left to right:
- Economic growth
- Environmental protection
- Social progress

Back cover:
- Palm oil fruit bunches

Credits

Writing and consultancy	Environmental Context, London
Cover design	Red Letter Design, London
Design	A10+, Rotterdam

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