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What on Earth is  
Sustainable Paper  
Consumption?

**Nick Robins**

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# SUSTAINABLE PAPER CONSUMPTION

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***WHAT ON EARTH IS  
SUSTAINABLE PAPER CONSUMPTION ?***

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Sustainable Paper Cycle Research Project

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# **WHAT ON EARTH IS SUSTAINABLE PAPER CONSUMPTION ?**

## **CONTENTS**

### **PREFACE**

### **EXECUTIVE SUMMARY**

### **ACKNOWLEDGEMENTS**

#### **CHAPTER 1.      INTRODUCTION; THE EMERGING CONSUMPTION AGENDA**

- 1.1 The Eco-Label Impasse*
- 1.2 The Origins of the Sustainable Consumption Debate*
- 1.3 Questions of Definition*
- 1.4 Changing or Reducing Consumption ?*
- 1.5 The Driving Forces for Change*

#### **CHAPTER 2.      LIMITS, EFFICIENCY & ETHICS; PERSPECTIVES ON SUSTAINABLE CONSUMPTION**

- 2.1 Planning for Environmental Limits*
- 2.2 Marketing Eco-Efficient Good and Services*
- 2.3 Developing Ethically-Driven Lifestyles*

**CHAPTER 3. THE SUSTAINABILITY OF PAPER CONSUMPTION**

***3.1 The Evolution of Paper Consumption***

***3.2 Are There Limits to Global Paper Consumption ?***

***3.3 Is Paper Consumption Eco-Efficient ?***

***3.4 Are Paper Consumption Needs Being Met ?***

**CHAPTER 4. CONCLUSIONS:  
WAYS FORWARD FOR SUSTAINABLE PAPER  
CONSUMPTION**

**REFERENCES**

## **PREFACE**

Consumption justifies production. If no-one is willing to buy paper then all the sustainability questions posed at different stages of the paper cycle fall away. The life cycle perspective has taught us that environmental impacts are generated at each stage of a product's life from design through manufacturing and use to final disposal. For some products, such as the automobile or a dishwasher, the environmental impacts during the use phase can be the most significant. This is evidently not the case for paper. The act of consuming paper itself has little or no environmental impact. Indeed for many paper products, the consumption phase is momentary (eg newsprint) or designed for a short-life (eg diapers). But it is also clear that paper consumption has both become a focus for popular concern about environmental impacts up and down the chain, notably forest management, pollution during manufacture and end of life waste, and a target for action to reduce these impacts.

This sub-study is a first attempt to portray the new and emerging agenda of 'sustainable consumption', an agenda that goes to the heart of why environmental resources are used and consumed, and how this relates to prospects for environmental sustainability and social equity.

The bulk of the study addresses this wider sustainable consumption agenda before going on to look at the specific questions of the sustainability of paper consumption. The explanation for this is that it is difficult to understand the reasons why there is increasing concern about the levels, types and purposes for which paper is being consumed without exploring the array of social, economic and ethical positions on the rights and wrongs of consumption as a whole.

The study is also qualitative in its analysis, emphasising underlying perspectives and approaches. No attempt is made to quantify the possible impacts of realising the competing visions that make up the sustainable consumption agenda. Equally there is no assessment of the economic costs and benefits of changing consumption patterns in different ways to meet different scenarios for sustainability. The primary focus is on the consumption patterns of the North for two reasons: first, the 1992 Earth Summit concluded that it was the responsibility of the North to take the lead in devising sustainable patterns of consumption; and second, it is in the North where the most extensive debate on the meaning of sustainable consumption has occurred to date.

A follow-up study funded by the Ministry of Environment - Norway will address in more detail the costs and benefits of different scenarios for sustainable paper consumption and will evaluate the effectiveness of different policy tools for changing consumption patterns (such as recycled content requirements, economic instruments, information and awareness raising, producer responsibility, procurement practices and community initiatives).

## EXECUTIVE SUMMARY

The study describes the emerging sustainable consumption agenda, and then looks at the specific case of paper.

The study starts by highlighting the sensitivities that surround issues of changing paper consumption to meet environmental goals, as exemplified by the furore over the EU's eco-label scheme (Chapter 1). It then traces the origins of the sustainable consumption debate back to the early 1970s, and points to the importance of the Earth Summit for placing the issue squarely on the international policy agenda. But debates around consumption are problematic, partly due to problems of defining key terms (including consumption itself) and partly due to misunderstandings over what to do with consumption (eg improving it or reducing it).

Four themes drive the post-Rio sustainable consumption agenda (Chapter 2). The first is a strategic concern for planning for environmental limits: experience with governmental and NGO plans is described. The second theme is that of demand side policy making, where environmental policy is starting to focus increasingly on the consumption phase of the life cycle as a way of yielding environmental benefits up and down the product chain. The third theme comes from the business community and deals with the marketing of more eco-efficient goods and services. Finally, the development of more ethically driven lifestyles is an important driver of the debate.

The study then turns to the specific issues of the sustainability of paper consumption (Chapter 3). Paper consumption has grown dramatically this century, although large gaps remain between North and South. The range of paper applications has also grown, and the much-heralded paperless economy has yet to arrive. There are three main criticisms of current patterns of consumption. First, that there are limits to the supply of wood fibre for papermaking; industry argues that there is no reason to economise on the use of wood to save forests. A second challenge is that paper use is inefficient and wasteful. Legislation in Europe is now focusing recently on reducing unnecessary packaging, while business are making efficiency gains in packaging and office paper uses. The third challenge is perhaps the most intractable, and relates to the continuing inability of the bulk of the world's population to sustain paper consumption levels to meet needs.

The concluding section points to ten critical factors which define the terms of the debate around sustainable paper consumption: environmental limits; equity and distribution; ethics; needs and services; steering innovation; intervention and regulation; population growth; costs and benefits; and dealing with uncertainty. The study closes by suggesting that one way of closing the gulf that separates industry, government and environmentalists on many of these issues is through the use of different scenarios of sustainable paper consumption: three scenarios are proposed.

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## CHAPTER 1.

### INTRODUCTION: THE EMERGING CONSUMPTION AGENDA

"But suppose 7 billion try to live like Europeans or Japanese? Suppose three-quarters of them move to the cities, seeking there the developed world's energy use and material consumption? There is no way in which such equations can be worked out. But what 'gives' on the collision course? Numbers? Yes - but whose? Consumption? Yes - but where? Or does the planet itself, with its precious, irreplaceable and finite resources of air and water and soil, come under increasing and irreversible pressure?"

*Barbara Ward and René Dubos, Only One Earth, 1972*

#### *1.1 The Eco-Label Impasse*

In November 1994, after almost three years of intense preparatory work, the European Union adopted criteria for awarding eco-labels to toilet rolls and kitchen paper. The EU's eco-label programme had been introduced in 1992 with much fanfare as an important market-based instrument for stimulating more environmentally sound patterns of consumption. But the gruelling debate on how to define what constitutes an environmentally preferable toilet roll only served to highlight the divisions that exist between and within governments, industry, environmental groups and consumers on the best ways forward.

One year later, not a single toilet roll had been sold with the eco-label in the EU's internal market. Indeed, leading paper associations openly opposed the scheme, recommending to their members not to apply for the eco-label. As a result, the primary purpose of the eco-label to inform the consumer has not been achieved for paper. The spectre of trade disputes with developing country exporters has also loomed large. Moreover, the EU's eco-label criteria differ from those adopted by the neighbouring Nordic countries, three of which are now EU Member States, as well as those prepared by other industrialised countries. But environmental and consumer groups have also argued that eco-labelling is an ineffectual response to the challenge of sustainable consumption.

The issues raised by the EU's eco-labelling criteria for tissue paper provide a foretaste of the battle that is starting to commence over the much larger question of sustainable paper consumption, part of the search since the Rio Earth Summit in 1992 to identify ways of meeting global demands for goods and services that preserve the environmental resource base for future generations. Paper is a highly symbolic product, with many powerful environmental associations in the minds of consumers, notably with deforestation and waste. It is no surprise therefore that paper consumption has become a focus for this new approach, moving the boundaries of the paper and environment agenda from traditional questions of recycled content and chlorine-free production to a new emphasis on the total volumes of paper consumed, the inefficiency and wastefulness of current paper use and concerns about the unequal distribution of paper consumption.

This study is a first attempt to clarify the emerging agenda surrounding the sustainable consumption of paper. Its purpose is to present and explain the many differing perspectives of governments, industry, environmental organisations and academics on consumption in general and the use of paper in particular. If it veers too much towards describing the positions of those who favour radical changes in the consumption status quo -- mostly environmental organisations from North and South -- this is largely because these have been the most vocal in their opinions and because the defenders of the status quo have yet to put a coherent case in their defence.

It is important to recognise that the issue of changing consumption patterns has only recently been revived as a priority environmental policy issue after a gap of almost two decades: the main question that policy makers have been struggling with since Rio has therefore been whether it is an issue worthy of attention. That question has now been answered in the affirmative, but many in government and industry whose interests might be damaged by changes or reductions in consumption still tend to act as if by ignoring the debate it will go away. A key conclusion of this paper is that this response is short-sighted: while the primary focus of the last two decades of environmental policy making has been on cleaning up industrial production process to supply greener versions of essentially the same goods and services, it is likely that the focus of the next generation of policy making will be on the more fundamental question of managing demand for goods and services so that needs are satisfied in ways that can be sustained indefinitely into the future.

The rest of this chapter seeks to provide a context for the international policy debate on sustainable consumption, and to tease out some clarity from the swirl of often abstract terms that are being used. Chapter 2 explores in more detail three of the four main perspectives on sustainable consumption: the reassertion of a belief in environmental limits; the move within the business community to focus on more eco-efficient goods and services; and the exploration of more ethical approaches to consumption and consumerism. Chapter 3 applies these perspectives to the particular case of paper consumption, illustrating these with some short case studies. Chapter 4 concludes with some suggestions for ways forward in understanding this new and often confusing environmental issue, laying out three scenarios of different futures for sustainable paper consumption.

## *1.2 The Origins of the Sustainable Consumption Debate*

More than 20 years after Barbara Ward and René Dubos first floated the 'what if?' questions posed at the start of this chapter, the reform of global consumption patterns has become one of the most controversial issues facing policymakers seeking to implement sustainable development. A new urgency has been brought to discussions concerning the potential collision course between human consumption and the planet. In 1987, the landmark World Commission on Environment and Development called for the development of new lifestyles "within the bounds of the ecological possible and to which all can reasonably aspire" (WCED, 1987). Seven years later, Gro Harlem Brundtland, Prime Minister of Norway and chair of the WCED pointed to the real constraints to a 'business as usual' extrapolation of consumption patterns:

"It is simply impossible for the world as a whole to sustain a Western level of consumption for all. In fact, if 7 billion people were to consume as much energy and resources as we do in the West today we would need 10 worlds, not one to satisfy all our needs" (MD, 1994)

A sign of the broad-based nature of this analysis was given in the unanimous adoption by governments of the Agenda 21 action plan for sustainable development at the United Nations Conference on Environment and Development in June 1992. The Agenda 21 section on *Changing Consumption Patterns* stated clearly that:

"The major cause of the continued deterioration of the global environment is the unsustainable pattern of consumption and production, particularly in industrialised countries, aggravating poverty and imbalances."

Agenda 21 went on to say that "developed countries should take the lead in achieving sustainable consumption", recommending research into "new concepts of wealth and prosperity which allow for higher standards of living through changed lifestyles that are less dependent on the Earth's finite resources and carrying capacity".

At the Earth Summit, the push for sustainable consumption was the geopolitical twin of efforts to restrain population growth. While some pointed to the rapid growth in human numbers in the South as a major threat to the planet, others argued that it was the "lifestyle overload" in the industrialised world and poverty in the developing world that had to be tackled first (<sup>1</sup>). Agenda 21 proposed the development of "new concepts of prosperity which allow for higher standards of living through changed lifestyles, less dependent on the Earth's finite resources and more in harmony with the Earth's carrying capacity". It recommended the reduction in wasteful packaging of products, and action to assist individuals to make environmentally-sound purchasing decisions through information programmes (including environmental labelling).

Three years after the Earth Summit, the first phase in this new international policy focus on consumption patterns has been completed. Championed by Norway and the Netherlands, governments have sought to define terms, set boundary conditions and agree upon priority issues. An important step was made at the 1994 Oslo Symposium on Sustainable Consumption, hosted by the Norwegian Government, which proposed a working definition of the goal as:

"The use of services and related products which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardise the needs of future generations."

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<sup>1</sup> At the 1994 Cairo Conference on Population and Development, the environmental dichotomy between poverty and "wasteful and extravagant" consumption was highlighted once again.

In February 1995, the Oslo Ministerial Symposium on Sustainable Production and Consumption drew up elements for an international work programme on sustainable production and consumption, which stressed the importance of partnerships along the product chain, the responsibility of governments to put the necessary frameworks in place (for example, through environmentally-sound pricing), the importance of extending producer responsibility for the environmental impacts of their goods, the importance of governments and businesses reforming their procurement and supplier policies and the need for practical tools to enable people to live sustainably.

Finally, in April 1995 the UN Commission on Sustainable Development which has the mandate to follow-up the Rio agreements adopted a work programme. This programme gave priority to analysing trends in consumption patterns, assessing the impact of changes in developed countries on the developing world, evaluating the effectiveness of policy measures and revising the UN's existing guidelines for consumer protection; the UN also hoped that governments will make "time-bound" and measurable commitments to achieve sustainable consumption. Alongside this work under the UN umbrella, the Environment Directorate of the Organisation for Economic Cooperation and Development (OECD) has embarked on its own work programme, starting with an attempt to clarify the conceptual foundations for policy making and action (OECD, 1995).

This review of the development of the post-Rio sustainable consumption agenda should not be taken to imply that the debate is driven or even dominated by governments. Indeed, as should become clear, governments have often been reacting to new ideas, signals and practices from environmentalists, consumers and business. It should also not be assumed that the debate is somehow closed or finalised. Indeed, a great deal of the excitement and interest generated so far by sustainable consumption is a response to the newness and the still embryonic nature of many of the discussions.

### *1.3 Questions of Definition*

Any discussion of consumption requires careful definition from the outset. The very word consumption has many different connotations. In its early English uses, the word consume had an unfavourable sense; it meant to destroy, to use up, to waste, to exhaust. More recently, consumption has been linked by economists to overall welfare, describing both the total spending in an economy on goods and services as well as the physical process of using a good or service. But when applied in environmental policy discussions, the term consumption can be misleading: "the implications of consumption conveyed in economic and lay literature as "going away", "being used up" is a misconception. In reality it is utility which is being "used up"; the mass of materials remains, along with some amount of degraded energy. More apt is considering consumption as resource use" (Bower, 1995). Consumption therefore has two parallel definitions: one monetary and economic and the other physical and environmental.

This problem of terminology is compounded by the fact that "consumption" is a somewhat technocratic term. In the USA, for example, a recent survey found that "consumption as a word has little public resonance...most people eventually agreed on the word materialism as a useful catchall term. Others preferred terms such as consumerism, selfishness, and/or

waste" (Merck, 1995). This semantic divide between "consumption" and "consumerism" is more than mere verbal juggling. The use of sustainable consumption as an umbrella for a variety of new and existing environmental policy questions has also obscured the reality that there are at least three major interpretations of what sustainable consumption is addressing: the macro-environmental concern with strategic resource management ("sustainable use"), the more micro-environmental policy concern with stimulating environmentally preferable patterns of demand ("sustainable services") and the ethically-driven search for more satisfying patterns of consumption ("sustainable consumerism") (Ark, 1995). To date, these overlapping but quite distinctive approaches have not been sufficiently delineated, contributing to a continuing uncertainty about the ultimate focus of attention.

#### 1.4 *Changing or Reducing Consumption?*

After deciding what consumption means, the next issue is to work out what needs to be done to it. Here, there appear to be four main options. The first is to focus on *reducing the negative environmental impacts associated with current patterns of consumption*. This can involve either the redesign of existing products or the introduction of new products, but essentially consumer behaviour and lifestyles stay the same: lightweighting packaging and recycled-content paper are examples of this approach.

A second option is to focus on *changing the patterns of consumption* so that existing needs are met in entirely different ways: the switch from paper to electronic mail is a prime example of this approach, whereby the whole rationale for a particular type of consumption is removed. The focus is not with individual products but with entire consumption systems, linking a range of complementary technologies: although the ultimate purpose of consumption may remain the same, the delivery mechanisms will change out of all recognition. For example, a new and distinctive consumption pattern for paper has been developed with the widespread diffusion of computers, printers and photocopiers. But these consumption patterns can become embedded in economic and social structures, limiting opportunities for change.

The third option is to *reduce consumption*. While the first two options seek to maintain or improve the services received through consumption, often the main focus of this third approach is to cut back consumption because of concerns about excessive environmental damage: greater weight is given to the environment than the welfare of the consumer. Thus leading pollution prevention experts Joel Hirschhorn and Kirsten Oldenburg state that the first principle for consumers to prevent pollution is simply to "buy less" (Hirschhorn & Oldenburg, 1991). But if policy makers are to move beyond voluntary renunciation, then less palatable options for reducing consumption come to the surface: enforced saving or reductions in income.

The fourth option is to *change the distribution of consumption*. Much of the concern about current consumption patterns is based on a double anxiety that first, much consumption is unnecessary or frivolous (here 'junk mail' is often cited) and second, that this compromises the ability to meet 'real' needs (for example, for educational purposes).

Clearly, these four options raise different issues and reflect the views of different interest groups. In the case of paper, while the industry has come to recognise the need to reduce the environmental impact of paper consumption (largely through changes in the forest, manufacturing and product design phase), it is understandably hostile to calls for absolute reductions in paper consumption. Different paper users on the other hand might see benefits in all four options.

For the paper cycle, these three approaches to reducing or changing consumption boil down to two fundamental questions:

- are we consuming too much paper ?
- are we consuming the most sustainable type of paper? <sup>(2)</sup>

The first quantity-based question leads to issues such as the efficiency of paper consumption and the fairness of the distribution of paper consumption within and between countries. The second, more qualitative question raises questions relating to paper specification of paper, such as the needs for brightness and recycled content. Again these two questions respond essentially to the multi-layered nature of the sustainable consumption debate: the question of whether we are consuming too much paper relates to the strategic planning concern with resource management ("sustainable use"), while the question of whether we are consuming the most sustainable type of paper picks up the demand management issue ("sustainable consumerism"). Both questions are addressed in later chapters of this study.

This fuzziness in the consumption debate has not been helped by the decision taken at Rio and repeated in subsequent meetings to focus both consumption and production patterns. Taken literally, a focus on both consumption and production means that the scope of enquiry becomes almost limitless and indistinguishable from the broader sustainable development debate. This attempt to deal with both consumption and production has contributed considerably to the diffuse nature of much of the policy debate within the UN and the OECD. This paper is therefore focused exclusively on the preconditions for making patterns of paper consumption sustainable. Inevitably, this will have ramifications down the production chain. But the starting point will be the ways in which end users -- whether households, corporations or government agencies -- choose, utilise and dispose of paper, and how these can be changed to eliminate negative social and environmental impacts along the cycle.

### *1.5 Driving Forces for Change*

To date, most discussions on sustainable consumption have sought to place the issue on the policy map. Far less attention has been given to situating these discussions within the real world dynamics of the market where consumption patterns are in constant flux, shaped by an array of driving forces, including:

- Economic growth and purchasing power
- Needs, wants, aspirations and expectations

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<sup>2</sup> A crucial dimension to such questions is of course, "who do we mean by we?"

- Price, information and product performance
- Advertising and marketing
- Competition and technological innovation
- Demographic dynamics
- Law and regulation
- Culture, tradition and habit
- Peer pressure and fashion
- Ethics, values and religion.

Assessing the sustainability of current and future trends in consumption for a particular commodity such as paper means matching these and other forces with the demands of the environmental resource base. The next chapter looks at three perspectives that place these driving forces within a framework of environmental sustainability.

## **2. LIMITS, EFFICIENCY & ETHICS:** **PERSPECTIVES ON SUSTAINABLE CONSUMPTION**

The new post-Rio sustainable consumption agenda is being driven by a range of overlapping perspectives on underlying concepts, priorities for change and tools for action. Four in particular stand out:

- \* *Planning for Environmental Limits:* A new wave of governmental and non-governmental 'sustainability plans', often underpinned by the concept of 'environmental space', are reasserting earlier notions that there are limits to the Earth's capacity to sustain development. A potent innovation is the argument that this limited capacity should be shared on an equal per capita basis. These plans are providing an over-arching framework within which businesses are being called upon to engage in an 'efficiency revolution'.
- \* *Demand Side Environmental Policy Making:* Environmental policymakers are increasingly using the consumption phase as an important point of intervention to reduce environmental at other phases of the product cycle. This is particularly the case with waste management, where European governments have recently started to establish policies to reduce the generation of waste at source, in other words at the consumption phase. Indeed a range of policy instruments are now being applied with the explicit aim of steering demand for goods and services towards more environmentally-preferable options: regulations (such as recycled content requirements for newsprint); economic instruments (such as product taxes); information measures (such as eco-labelling); and procurement policies (<sup>3</sup>).
- \* *Marketing Eco-Efficient Services:* Where business, governments and environmental organisations all agree is that the primary tool for achieving sustainable consumption is to improve radically the efficiency with which environmental resources are used. A special focus of the new business-led emphasis on eco-efficiency is in its emphasis on the need to progressively separate the provision of services from environmental impacts through options such as miniaturisation, lightweighting, materials cascading and product life optimisation. Within the policy world, the eco-efficiency agenda is expressed by recent efforts to avoid the generation of waste (particularly packaging) by making producers responsible for the ultimate fate of their products.
- \* *Developing Ethically-Driven Lifestyles:* Throughout history, consumption patterns have been subject to ethical control and critique. In the secular consumer economies of North America, Europe and East Asia, concern for the environment has replaced religion as the principal ethical response to consumption. This is expressed in critiques of the upward spiral of need inherent in consumer economies and in a growing range of community-based initiatives to develop more ethically-driven lifestyles.

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<sup>3</sup> The issues relating to demand-side environmental management are not addressed in detail in this paper, but are tackled in other sub-studies for the Paper Cycle project.



## 2.1 *Planning for Environmental Limits*

The starting point for much of the sustainable consumption agenda is anxiety about the Earth's ability to sustain the rapid increase in resource use experienced over the past hundred years into a future with continued economic and population growth. In the USA, per capita consumption of steel has grown fourfold, copper fivefold, paper sevenfold and concrete sixteenfold over the last century (Young & Sachs, 1991). Worldwide, seven times more manufactured goods are consumed today as in the 1950s; per capita consumption of copper, energy, meat, steel and timber has doubled (WCED, 1987 and Durning, 1992). To reduce the inevitable pressure on the environment that this "consumption explosion" has brought, many argue that deep changes in consumption patterns are required, based on an assumption of limits to the Earth's carrying capacity.

As early as the 1950s, concern was mounting about the rate of resource depletion in the post-war US economy, and President Truman's Materials' Policy Commission argued that "the United States' appetite for materials is Gargantuan -- and so far insatiable" (quoted in Packard, 1960). In the 1960s and 1970s, this security of supply debate became transformed by environmentalism into the polemic over the 'limits to growth', often simplistically characterised in terms of fears about 'running out of resources'. Since then, trends in resource use over the last two decades have shown little or no evidence of overall shortages in the supply of key resources. Attention has turned more to the capacity of the environment to cope with wastes and pollution caused by resource use, where related concepts of 'carrying capacity' and 'critical loads' have proved useful in tackling transboundary problems such as acid rain.

The emergence of 'sustainable development' as the preferred approach to managing the world's environmental problems in the 1980s gave a new twist to these early ideas of physical limits. The World Commission on Environment and Development made it clear in its 1987 report, *Our Common Future*, that limits was one of the two conceptual pillars on which the global goal of sustainable development rests, the other being the overriding priority to meet needs, particularly those of the poor. But rather than suggesting that there were fixed limits to resource use, the Brundtland Commission took a dynamic and flexible approach, stressing the "limitations imposed by the state of technology and social organisation on the environment's ability to meet present and future needs", and called for a new era of economic growth (WCED, 1987).

An important policy response to the challenge of sustainable development was the introduction of 'sustainability planning', during the late 1980s and early 1990s (IUCN & IIED, 1995). These plans have been designed to track and reconcile often conflicting trends in economic development, consumption of resources, environmental damage and human numbers. Here, the focus of sustainable consumption is on the macro-consumption of natural capital. This approach was exemplified by the Netherlands National Environmental Policy Plans and the EU's Fifth Environmental Action Programme (VROM, 1989 & 1994; EC, 1993a).

The first Dutch National Environmental Policy Plan (NEPP) was published in early 1989, with the strategic goal of preserving "the environment's carrying capacity for the sake of sustainable development". The NEPP responded to a powerful report from the government's Institute for Public Health and the Environment (RIVM), *Concern for Tomorrow*, which had

led to a recognition from the then Environment Minister Ed Nijpels that the country was probably "the most polluted in the world". The NEPP took as its objective the achievement of sustainable development within a single generation, and laid out three costed scenarios for 2010: 'business as usual', the maximum use of emission-control measures and a more structural scenario mixing emission control and structural measures (including considerable shifts in favour of energy conservation, recycling and public transport). The NEPP estimated that this latter scenario would cut back economic growth by just over 4% between 1998 and 2010 from 99% to 95%, while the business as usual scenario would involve a smaller cut of 1.3%.

The NEPP proposed a compromise package of 200 quantified targets to a range of local, regional, national, pan-European and global environmental threats. While some of these were quite radical -- for example cutting sulphur dioxide emissions by 80% by 2010 -- others, notably reductions for the greenhouse gas, carbon dioxide, were substantially less than the requirements for sustainability outlined in *Concern for Tomorrow*. The NEPP did, however, mark a significant break with the past, and in particular pioneered a new approach of reaching out to target groups in industry and society to tackle environmental problems in partnership with government.

The NEPP was strongly criticised by Dutch environmental campaigners. Teo Wams of Milieudefensie stated that "the government backs away every time the need for structural changes in production and consumption is mentioned" (Wams, 1991). With a view to the 1992 Earth Summit, Milieudefensie drew up an alternative strategy, the *Action Plan: Sustainable Netherlands* (Milieudefensie, 1992). This drew on the concept of 'environmental utilisation space' devised by Professor J.B. Opschoor of the Free University, Amsterdam. For Opschoor 'environmental utilisation space' (or eco-space) expresses the recognition that "at any given point in time there are limits to the amount of environmental pressure that the earth's ecosystems can take without damage to these systems or the life support processes that they enable" (Opschoor & Weterings, 1995).

This notion of eco-space does not imply a static view of the environment or society: societies can be more efficient with available environmental space, and can even expand the available eco-space through more efficient technologies or through lifestyles with a smaller environmental claim per unit. As a result, there are no limits to growth per se, as long as society upgrades its technologies and consumption patterns in line with economic expansion. Defining the amount of available environmental space depends on taking a number of ethical a priori assumptions, notably how to share the available environmental resources within and between generations and with other species and how to take account of uncertainty about ecological processes.

Milieudefensie took this concept of 'environmental space', and used it as the building block for their alternative strategy in the Netherlands, defining it as "the total amount of pollution, non-renewable resources, agricultural land and forests that we can be allowed to use globally without impinging on the access of future generations to the same amount" (Milieudefensie, 1992). Milieudefensie then decided that "each country has a right to the same amount of environmental space per capita: the equity principle".

This dual emphasis on both the environmental performance and distribution of consumption patterns mirrored the analysis and conclusions of the Earth Summit. A report prepared for UNCED showed that 20% of the world's population in the rich 'North' accounted for 50-90% of consumption and pollution. For paper products, the North consumes over 80% of the total, with an average per capita consumption of 148 kg compared with an average of 11 kg in developing countries. The disparity between benchmark countries such as the USA and India is even more extreme: the average US citizen consumes 227 times as much gasoline and 115 times as much paper as the average Indian (Parikh et al, 1991). The Agenda 21 chapter on *Changing Consumption Patterns* confirmed that an essential component of sustainable development was to take account of the "current imbalances in the global patterns of consumption and production" between North and South.

Milieudefensie's alternative plan took five key indicators of sustainability -- energy, freshwater, aluminium (representing a non-renewable resource), available land for agriculture and wood -- and calculated the reductions in current Dutch consumption levels required for the Netherlands to live within its environmental space by 2010. By 2010, the world economy would have expanded and population numbers grown to about seven billion: this means that the same or smaller amount of eco-space has to be shared among a greater number of richer people, inevitably reducing the per capita share.

This fusion of the Brundtland's two pillars for sustainable development -- environmental limits and human needs -- has radical implications (Table 1). The first is to move the concern with environmental management from dealing with end of pipe emission control to managing both renewable and non-renewable resource inputs. The second is to propose an egalitarian approach to sharing or rationing these limited resources. Thus, while the NEPP proposed reductions in carbon dioxide by 3-5%, Milieudefensie argued for a reduction of 60%. The link between needs and environmental limits is perhaps strongest in the case of agricultural land. Here, placing a priority on meeting food security needs would require a reduction in the current Dutch land use of 45% by 2010 -- in effect cutting meat consumption from about 180 kg per person per annum to about 60 kg. Despite this, Milieudefensie are careful to point out that "environmental space is not the same thing as consumption. If, for example, we reduce the use of fossil fuels by two-thirds and utilise the remaining third three times more efficiently, the benefit stays the same".

**TABLE 1**

<b>The Netherlands' Environmental Space Per Capita</b>	<b>Now</b>	<b>2010</b>	<b>% Reduction</b>
<u>Energy</u> Tonnes of CO <sub>2</sub> emissions per year	11	4.3	60
<u>Freshwater</u> Piped water in litres per day	130	80	38
<u>Aluminium</u> Kg per year	10-12	2	80
<u>Agriculture</u> Hectares	0.45	0.25	45
<u>Wood</u> Cubic metres per year	1.1	0.4	65

*Source: Milieudéfensie, 1992*

These radical results are produced by the assumptions. Milieudéfensie's definition of 'timber space', thus assumes that the cessation of logging in primary forest is essential, along with the maintenance of biodiversity, woodland regeneration and respect for local communities. In addition, Milieudéfensie argues that "timber plantations are not an option, because they do not fulfill the goal of sustainable forest management". These assumptions can be contested on a number of grounds. The decision to include the management of non-renewable resources as a factor for sustainable consumption is also controversial, going against lessons of recent experience.

In spite of these concerns, the reason for dwelling at such length on 'environmental space' is because it currently dominates the post-Rio discussions on sustainable consumption. The Dutch Government, for example, gave support in principle to the concept of environmental space in its second National Environmental Policy Plan issued in December 1993, while the Danish Government in its 1995 Nature and Environment Policy adopted the mirror principle of 'ecological scope' to describe its strategic objective of "consumption of physical resources, over a number of years, will have to be brought into line with the principles of a fair and even global distribution within the limits of total consumption as dictated by consideration of future generations" (Danish Ministry of Environment and Energy, 1995). The Milieudéfensie approach has now been adopted by Friends of the Earth Europe, who have launched a *Sustainable Europe* campaign, in which 29 Friends of the Earth affiliates are preparing national plans, feeding into a pan-European action plan (Friends of the Earth Europe, 1995).

Within the research community, a similar approach has been promoted by the Wuppertal Institute, Germany, where Professor F. Schmidt-Bleek has argued that man-made material flows have reached such an extent that an overall reduction of 50% reduction is required to "stabilise the ecosphere". Given projected increases in population and the need for economic development in the South, this would translate into the operational need for "western type goods and services to be de-materialised by a factor of 10 or more" over the next half century (Schmidt-Bleek, 1992). A Factor 10 Club has grown up around this analysis, bringing together leading researchers from North America, Europe and Asia, and urging a substantial shift in fiscal and pricing systems to stimulate a revolution in resource productivity (or eco-efficiency) (Factor 10 Club, 1994).

But within the wider international environmental policy debate, there are significant doubts about the environmental space approach. On closer inspection, it becomes clear that supporters of the environmental space approach are made up of a relatively narrow group of largely northern European environmentalists and academics, together with a few policy makers, and even fewer industrialists. A number of governments led by the UK and the USA have sought to undermine the environmental space concept in the post-Rio policy debates, largely because of its radical redistributive drive. While this counter-attack has achieved some success in downplaying environmental space, these and other governments opposed to this radical interpretation of sustainable consumption have yet to put anything coherent in its place.

In summary, arguments surrounding the utility of the environmental space approach to sustainable consumption revolve around three main issues of faith and judgment: disagreement with the reassertion of limits; opposition to the scale of planning implied; and alternative approaches to equity that stop short of resource equality.

\* *The Reassertion of Limits:* Taking a historical approach, environmental space can best be seen as the leading idea within an evolving "second limits to growth" controversy that started in the run-up to Rio. Indeed the original Limits to Growth research team published their own reassessment in 1992, arguing that "in spite of the world's improved technologies, the greater awareness, the stronger environment policies, many resource and pollution flows had grown beyond their sustainable limits" (Meadows *et al.*, 1992) (see Box 1). There are at least two major criticisms of the 'environmental space' definition of limits. The first is to reject the notion of absolute, physical limits. This has been the response of neo-liberal economists, such as Julien Simon and Wilfred Beckerman (Beckermann, 1995). Many of their arguments have now been taken on board in the relativist definition of limits proposed by Brundtland and taken further by Opschoor and others.

A second potential criticism flows from an acceptance that some notion of limits is justifiable, but disagreement with the definition of limits. Environmental space uses a 'strong sustainability' definition of limits, whereby environmental resources, such as biological diversity or climatic stability cannot be traded off against increases in man-made wealth. But there is another competing 'weak sustainability' definition which means that environmental resources can be traded off against man-made capital as long as future generations receive a total capital stock of natural and man-made assets no less than the one that currently exists: "we can pass on less environment as long as we offset this loss by increasing the stock of roads and machinery or other man-made capital" (Pearce, 1993). The Sustainable Europe

campaign makes it clear that their approach is "fundamentally different from what is called weak sustainability i.e defining the limits to use according to a compromise between the needs of the environment and economic costs. Since this latter definition is based on an economic cost-benefit analysis at current cost levels, it systematically underestimates the real value of the environment" (Friends of the Earth Europe, 1995). In fact, none of the scenarios developed using 'environmental space' have yet been assessed in terms of the quantified costs and benefits of achieving them.

Although this second limits to growth controversy is certainly more sophisticated than the first, it has still "attracted its fair share of oversimplifications, if not outright intellectual dishonesty, on both sides", according to Norwegian researcher Jon Hille (Hille, 1995). Hille takes issue with "simple exercises in multiplication, purporting to show that if everyone on Earth were to consume resources or to pollute at the rate Northerners do today, then the 'world would break down'". But the breakdown of the world is hard to envisage as an objective event, and that the consequence of unsustainable consumption is unlikely to be a cataclysm, but a steady decline into a more insecure, dangerous and ugly world.

Knowledge of limits can at best be approximate and can imply "value judgments with which it is legitimately possible to agree" (Hille, *ibid*). Scientists can certainly help to identify many of the thresholds beyond which environmental damage occurs. But ultimately, claims concerning the existence, extent or absence of limits are based on widely differing values systems and assumptions about the relations between society and nature. The definition of limits is thus inevitably based on a combination of scientific understanding of such factors such as carrying capacity and critical loads, and political judgements concerning the values that are attached to certain environments: "these limits are not to be found in the environment itself, but must necessarily follow from a social decision-making process" (Sips *et al.*, 1994/5).

## BOX 1 - THE LIMITS TO GROWTH - THEN AND NOW

Donella Meadows *et al.*, *The Limits to Growth* (1972)

"1. If the present growth trends in world population, industrialization, pollution, food production, and resource depletion continue unchanged the limits to growth on this planet will be reached sometime within the next 100 years. The most probable result will be a sudden and uncontrollable decline in both population and industrial capacity.

2. It is possible to alter these growth trends and to establish a condition of ecological and economic stability that is sustainable far into the future. The state of global equilibrium could be designed so that the basic material needs of each person on earth are satisfied and each person has an equal opportunity to realise his or her individual human potential.

3. If the world's people decide to strive for this second outcome rather than the first, the sooner they begin working to attain it, the greater will be their chances of success."

Donella Meadows *et al.*, *Beyond the Limits* (1992)

"1. Human use of many essential resources and generation of many kinds of pollutants have already surpassed rates that are physically sustainable. Without significant reductions in material and energy flows, there will be in the coming decades an uncontrolled decline in per capita food output, energy use and industrial production.

2. This decline is not inevitable. To avoid it two changes are necessary. The first is a comprehensive revision of policies and practices that perpetuate growth in material consumption and in population. The second is a rapid, drastic increase in the efficiency with which materials and energy are used.

3. A sustainable society is still technically and economically possible. It could be much more desirable than a society that tries to solve its problems by constant expansion. The transition to a sustainable society requires a careful balance between long-term and short-term goals and an emphasis on sufficiency, equity, and quality of life rather than on quantity of output. It requires more than productivity and more than technology, it also requires maturity, compassion and wisdom."

\* *The Revival of Planning:* As was explained above, the assertion of the need for 'fair shares' of the Earth's limited carrying capacity has been partially a response to the new generation of 'sustainability plans' presented by governments in the last decade. There is some substantial irony here. During the same period, centrally planned communism -- the greatest challenge to the liberal market order -- collapsed under its own contradictions. While it is clear that the expanding array of post-Rio national sustainable development strategies and plans are very different from the doomed five year plans of the Soviet bloc, the institutional mechanisms to deliver a 'fair shares' world at a global level go far beyond the scope of traditional multilateral environmental agreements. This newfound faith in global planning also comes at a time of a considerable backlash against regulation in many countries, led by the conservative Wise Use movement in the USA, which rejects not only the need for intensified environmental protection, but has sought to undermine much of existing federal environmental legislation.

Even sympathetic analysts such as Wolfgang Sachs argue that global 'sustainability planning' on this scale is sheer hubris, "rationing out what is left of nature" (Sachs, 1993). The most severe test of the feasibility of such an approach will be the progress with the implementation of the Framework Convention on Climate Change, where issues of long-term strategic planning of energy, a core resource for development, has perhaps gone furthest. The signs from the First Conference of the Parties, held in Berlin in March and April 1995, are not encouraging.

Where the environmental space approach does have merits is in the different but related field of scenario planning. Indeed it is as a scenario of a possible and desirable future that Milieudefensie and others have presented their conclusions: their efforts are therefore to be taken as a stimulus to thought and action and not necessarily as a hardfast prescription for planned implementation. And Milieudefensie stresses repeatedly that the defining aspect of their approach is that it is an "equity scenario".

\* *The Egalitarian Definition of Equity:* The principle of equity or fairness lies at the heart of most interpretations of sustainable development. One of the principal contributions of the environmental space approach is that it restores the social dimension to discussions of sustainability, a dimension often sidelined in the late 1980s. However, equity does not necessarily have to be defined in terms of strict equality as is the case with 'environmental space'. Although a free market economy leads inevitably to unequal outcomes, these can still be regarded as equitable. Indeed, two hundred years ago Adam Smith argued that inequality between rich and poor has a social function since the rich are "led by an invisible hand to make nearly the same distribution of the necessities of life, which would have been made, had the earth been divided into equal portions among all its inhabitants" (Smith in Ignatieff, 1984).

The vision presented by the egalitarian definition of equity implies a radical overhaul of the international economic system on a par with the now defunct New International Economic Order demands of the 1970s. It challenges head-on long accepted notions both of sovereign control over resources and of the international division of labour. The decision to take a per capita basis for evaluating equity also allows for considerable population growth, and indeed could give a perverse incentive for increasing human numbers, since a country's allocation of 'eco-space' would expand in line with its population. The reassertion of the need for global



redistribution also comes at a time of a crisis of legitimacy for financial transfers between North and South. Since Rio, the North has failed to increase aid spending as outlined in Agenda 21. Aid has fallen in 17 of the 21 developed country donors since Rio, and further decline is likely.

The country level benchmark for per capita distribution of environmental space also passes over the widening inequalities within North and South. Many in the South now have higher levels of consumption, generating more environmental damage than many in the North: there are more affluent middle class consumers in India than in the European Union, and their ranks are likely to be swelled in the decades to come. Finally, there is no guarantee that reduced consumption of resources in the North will translate into sustainable development for the South: "simply making a resource available does not confer on anyone the power to consume it" (Pearce, 1994).

Environmental space thus shies away from recognising that consumption choices are based on purchasing power: redistributing rights to resource use inevitably implies redistributing income and wealth. Convincing scenarios for more environmentally sustainable consumption patterns that stay within the Earth's limits, but maintain existing income inequalities can be made: this is the heart of the eco-efficiency perspective presented next. Different countries also have very different levels of tolerance of inequality, and in the USA, for example, "rigid equality of consumption goes against the U.S. ethic of individual choice and the deep acceptance this country's citizens have of great disparities in wealth" (Hittle, 1994). Greening the consumption status quo in this way avoids the deep political problems that surround redistribution. But it also avoids the ethical imperative of meeting the needs of the poor.

## 2.2 *Marketing Eco-Efficient Goods and Services*

If a powerful underlying theme of the planning for environmental limits perspective is a sense of constraint, then the guiding thread of marketing eco-efficient goods and services is one of business opportunity: how to create economic benefit out of the environmental challenge. This builds on the evidence of the momentum inherent to market economies to reduce continuously the resources used for each unit of output, and takes it further by making the search for more environmentally efficient outcomes a part of wider business objectives.

German researcher Martin Janicke has plotted the steady decline in the consumption of key environmentally damaging commodities -- cement, crude steel and freight transport -- once annual per capita income levels rise above \$8000 (Janicke *et al.*, 1988) (see Figure 1). These trends are largely the result of deep structural changes towards an economy based more on the service and information sectors, reducing material intensities and thereby environmental impacts. The steady decline in energy intensity within the OECD -- or total primary energy requirements per unit of GDP -- has been taken as an important indicator of sustainable development (see Figure 2) (OECD, 1991). Between 1970 and 1990 OECD countries became 20% more energy efficient in producing each unit of output, reflecting structural economic change, oil price rises and to a limited extent, energy conservation measures.

One of the first attempts to make the decoupling of resource use and service provision an explicit objective of economic development was made by Amory Lovins in his 1977 book, *Soft Energy Paths*: "People do not want electricity or oil, but rather comfortable rooms, light, vehicular motion, food and other real things" (Lovins, 1977). Lovins and others demonstrated that the things that people want could be delivered with considerably less energy. Radically improved resource efficiency was also at the heart of the Brundtland Report's upbeat strategy for coping with the environmental consequences of the "five to tenfold increase in manufacturing output needed just to raise developing world consumption of manufactured goods to industrialised world levels by the time population growth rates level off next century" (WCED, 1987).

Experience with pollution prevention and waste minimisation strategies converged in the run-up to Rio in the definition of a new phrase conceived by the Business Council for Sustainable Development: eco-efficiency. In *Changing Course*, the BCSD's report to the Earth Summit, eco-efficiency was used to describe those corporations that "achieve ever more efficiency while preventing pollution through good housekeeping, materials substitutions, cleaner technologies and cleaner products, while striving for more efficient use and recovery of resources" (Schmidheiny, 1992).

Figure 1 Index of Environmental Damage

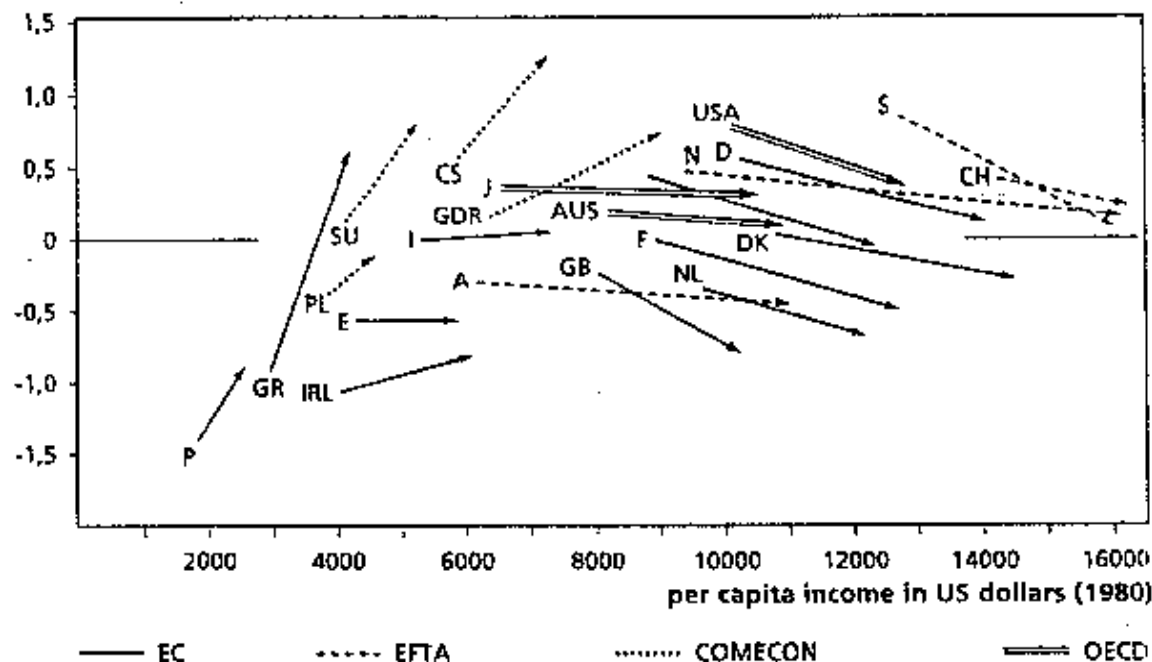
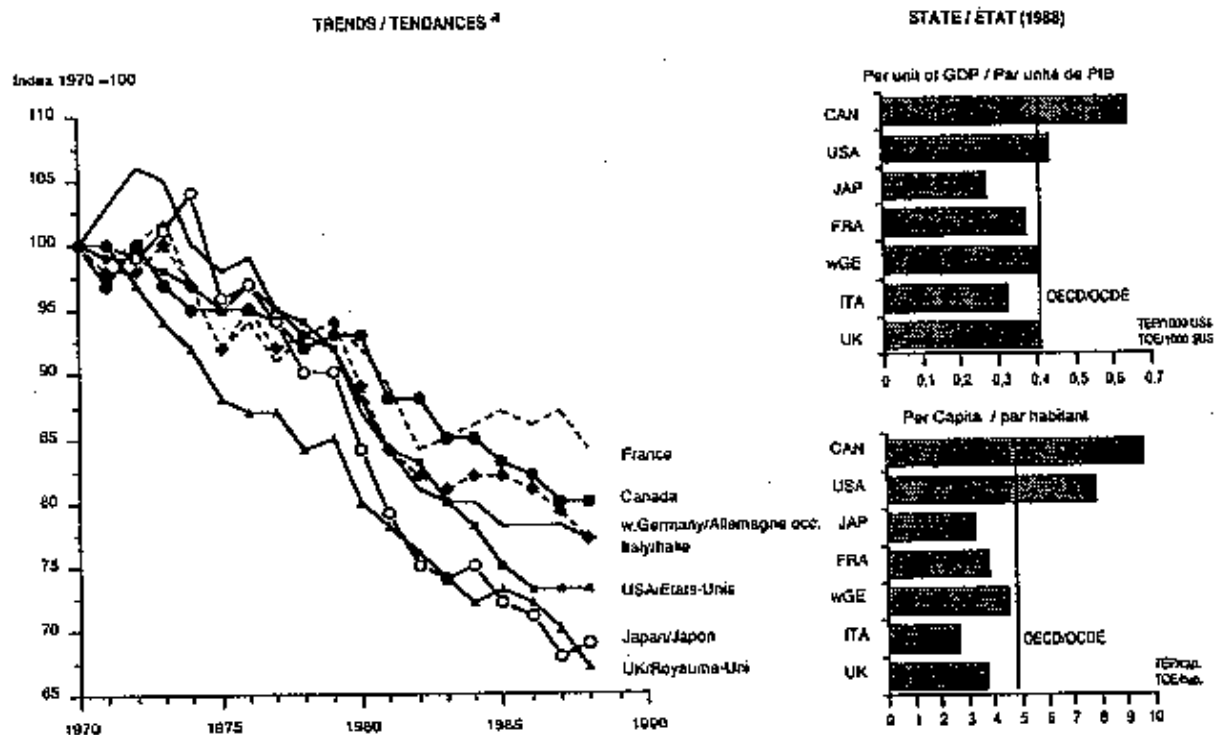


Figure 2 Total Primary Energy Requirements per Unit of GDP



Since Rio, eco-efficiency has been linked more to the provision of services at minimal environmental cost. Thus, at its Antwerp Workshop on Eco-Efficiency in November 1993, the BCSD developed a more comprehensive definition:

"Eco-efficiency is reached by the delivery of competitively-priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts and resource intensity throughout the life cycle, to a level at least in line with the Earth's estimated carrying capacity" (BCSD, 1993).

The eco-efficiency approach seeks to build on the real world success of companies with total quality management, process re-engineering and life cycle management, and take this further by stressing the need to accentuate the positive linkages between economic and ecological efficiency. Claude Fussler, Vice-President, Environment, Health and Safety at Dow Europe stresses that eco-efficiency measures the entrepreneur's "simultaneous effort to minimise the ecological burden while he maximises the economical value he can afford to produce and his customers can afford to pay" (Fussler, 1995). Fussler argues that there are six main dimensions which should guide businesses to become more eco-efficient:

- *De-materialise* by reducing the total of raw materials, fuels and utilities consumed during the entire life cycle needed to deliver a desired function.
- *Increase energy efficiency* not only in assembly, but also in the consumption and disposal phases.
- *Eliminate toxic effects* by reducing and controlling the dispersion of materials that threaten environmental quality and human health.
- *Close the loop* by designing for recyclability and then recycling efficiently and effectively.
- *Borrow from natural cycles* so that materials are borrowed and returned to nature without negatively affecting the balance of the cycle.
- *Extend service life and enhance functionality* through product durability, especially in the use phase.

Companies that are adopting the eco-efficiency approach, such as 3M, Ciba, Dow and Rank Xerox, are not doing so out of altruism, but because of a combination of market pressures to raise environmental performance and commercial imperatives to improve productivity. Often the greatest leaps in eco-efficiency have not been driven by environmental impulses. In the automobile industry, 'lean production' has led to productivity improvements of a factor of three by making management, technological and commercial innovations throughout the product life cycle. Similarly, the electronics industry has achieved a number of significant eco-efficiency gains as a by-product of improved service provision. Energy consumption per unit of computing power has fallen, miniaturisation has cut raw material use, while software advances have reduced the costs of many basic business tasks. Peter Drucker has noted that whereas materials made up 40% of the value of a car, the archetypal product of the industrial

age, material costs only account for 0.3% of the micro-chip, the representative product in the new information age.

Tools are also being developed to help businesses assess their success at delivering services in an environmentally efficient manner. At the Wuppertal Institute in Germany, Professor Friedrich Schmidt-Bleek has developed a measure of the Material Intensity Per unit of Service (MIPS), which can be used to calculate the total material and energy throughput, which occurs during the entire life cycle of a particular good (Schmidt-Bleek, 1992). The MIPS method has been used on an experimental basis to redesign a range of goods, including private homes, cars and other products, such as sticky tape dispensers. Rethinking design is crucially important to the eco-efficiency approach. According to Ezio Manzini a designer at the Domus Academy, Milan, Italy, it is design that gives "form to a changing world and offers opportunities for new types of behaviour", and shows that sustainable consumption can mean a culture of quality and not one of renunciation (Manzini, 1993).

The eco-efficiency approach is rich in a diverse array of technological and lifestyle options for achieving sustainable consumption. These include lightweighted packaging and miniaturised electronics; materials cascading through remanufactured photocopiers; and reducing the intensity of consumption by leasing rather than owning products, or using products collectively, for example through car pooling. Eco-efficiency thus thrives on innovation, and the constant creation and re-creation of new products and services. Indeed one of the signs of hope for the realisation of the eco-efficiency approach is the current acceleration of product innovation, which means according to one early 1990s forecast that "if present trends continues, 50% of products which will be in use in 15 years time do not yet exist" (OECD, 1991).

Eco-efficiency can thus be interpreted at two levels: as a micro-management tool to generate commercial advantage through resource conservation, pollution prevention and efficiency gains, thus partially responding to the "sustainable consumerism" agenda and as a more strategic approach to reorienting the goals and assumptions of economic development, responding to the "sustainable consumption" agenda. It is in this second interpretation that supporters of 'environmental space' employ eco-efficiency as a primary means of achieving their desired reductions in resource use and pollution. Indeed the BCSD has acknowledged that a twenty-fold improvement in eco-efficiency may be required over the next half century.

The eco-efficiency approach is not, however, the exclusive domain of business. In Europe, this strategic vision has now become part of economic policy of the European Union. The EU's 1993 strategy for economic recovery, the White Paper on Growth, Competitiveness and Employment argued that the current tendency of the European economy to overuse environmental resources should be replaced by "a strategy to offer society a better quality of life with a lower consumption intensity and as a consequence with a reduced stress on environmental resources" (EC, 1993b). Governments are also implementing waste management and product procurement policies to drive materials efficiency and pollution prevention.

New waste management policies in Europe are also driving companies to become more eco-efficient by forcing them to take responsibility for the waste that their products cause.

Since the 1970s, planners and policy makers have devised an ideal waste management hierarchy, placing priority on the reduction of waste, followed by waste reuse, recycling, recovery (composting and energy); only when these options have been exhausted, should waste be disposed of. The reality of waste management over the past two decades has been the reverse, with emphasis placed on expanding the supply of landfill and incineration to meet growing volumes of waste. Only recently have policy makers started to take the waste management hierarchy seriously, setting specific targets for the stabilisation and reduction in waste. For example, the European Community's strategy for sustainable development has set an overall target of stabilizing the quantities of waste generated each year at an EC average of 300 kg per capita (EC, 1993a). The Dutch Government has gone further, establishing an interim goal of reducing waste volumes by 10% by the year 2000 (VROM, 1989).

A central theme of these recent efforts to reduce waste at source has been a redefinition of the division of labour for dealing with waste among producers, consumers and waste authorities. In Europe, the 'extended producer responsibility' (EPR) approach aims to make manufacturers responsible for the life cycle impacts of their products, for example, through the introduction of 'take-back' requirements for packaging and consumer durables. In effect, EPR drives the long-standing goals of making the polluter pay and internalising environmental costs up the product chain: "the imposition of producer responsibility represents perhaps the most literal version of internalisation: producers retain legal or even physical responsibility for their product from cradle to grave" (Lifset in Lund, 1992). Packaging has been the testing ground for extended producer responsibility with Germany, the Netherlands and Sweden in the lead: the implications for the consumption of paper are discussed in Chapter 3.

But even the business community recognises that there are a range of substantial bottlenecks to making eco-efficiency more than a minority concern of a handful of sophisticated corporations. Environmental costs are rarely internalised into market incentives, thereby giving implicit incentives to intensive resource use. In many countries, North and South, the use of public land, forests, energy and water are still heavily subsidised providing perverse subsidies for waste: governments are paying the polluter. Continuing growth in consumption can overwhelm the benefits of eco-efficiency, as the energy and transport sectors demonstrate. But since it is absolute rather than relative pressures from human activity that generate environmental damage, there are limits to the usefulness of an exclusive focus on efficiency improvements if these obscure increases in total consumption. Thus, despite the energy efficiency improvements between 1970 and 1990, total energy consumption rose by a quarter and carbon dioxide emissions grew by 15%.

Corporate performance is still often measured in terms of throughput and volume and not in terms of services delivered at least environmental cost. Existing economies of scale and inherited infrastructure also create inertia that restrains the development of new patterns of consumption: new products and services often have to fit within existing resource intensive transport, energy and housing structures. Capital markets continue to have short-term financial priorities. This leads to the greatest dilemma with the eco-efficiency approach: that it will only work when it is in the self-interest of corporations and consumers. There are also other dilemmas that businesses find difficult to address such as how can companies address the issue of extending services to the poor rather than simply responding to the already affluent, and facing up to their own responsibility for generating new needs through advertising and marketing.

### 2.3 Developing Ethically-Driven Lifestyles

Throughout history, consumption patterns have been subject to ethical control and critique, usually sanctioned by religious injunctions to renounce the use of certain materials, foods, drinks or luxury practices. In the secular consumer economies of North America, Europe and East Asia, concern for the environment has largely replaced religion as the principal ethical response to consumption. Elizabeth Dowdswell, Executive Director of UNEP has argued that "ultimately, sustainable consumption is not a scientific or a technical question. It really is first and foremost a question of values".

This ethical dimension to sustainable development was underlined in the 1992 *Caring for the Earth* strategy adopted by the World Conservation Union, the United Nations Environment Programme and the World Wide Fund for Nature. This proposed an "ethic for living sustainably", which it claimed to be "morally right" and without which "the human future is in jeopardy" (IUCN, UNEP, WWF, 1992). One consequence of adopting such an ethic, according to the strategy, would be to stimulate changes in attitude and behaviour, so that people did not seek fulfillment "solely (or even largely) through indefinite growth in their personal level of consumption". Such statements are defiant, and admit of little room for disagreement. Indeed, this ethical impulse is based on a rejection on economic calculation as a basis for environmental management. They are the inheritors of a strong strand in Western culture that is at odds with modern industrial development process, sometimes leading to support for pre-modern lifestyles as less exploitative, more satisfying and inherently environmentally sustainable (\*).

In the emerging economies of Africa, Asia and Latin America, some argue that religion still has the potential to form the ethical foundations for sustainable consumption. Emil Salim, Indonesia's former Environment Minister has argued that "In the ethics of life of most developing countries the interlink of man-society-nature and God is still valid, while in most developed countries the ethics of life are concerned with man alone. Such an ethic of life in the South allows for the further enhancement of environmental ethics based on the concern for the environment as God's Creation. It is therefore essential that the South enhance further the environmental ethics and pull the North along on this path" (Salim in Miljøverndepartementet, 1994). Indeed, there have been numerous efforts to green Christianity, marked most recently by the Orthodox Church's International Environmental Symposium to celebrate the 1900th anniversary of the apocalyptic Book of Revelation.

Other societies are also reaching back into their spiritual traditions to find a basis for progress towards sustainability. In Japan, the term environmentally-friendly (*yasashii*) originates from the word *yasu* meaning 'to become thin', the implication being that by having sympathy and giving to others, a person could become thin. In a recent report on environmentally-friendly lifestyles, the Government of Japan suggested that "from now on, it is hoped that this type of 'kindness' will be incorporated in our lifestyle and in our actions" (Environment Agency,

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<sup>4</sup> Jean-Jacques Rousseau is the archetype of this rejection of modernity and the upward spiral of need and satisfaction that it has brought. In his 1754 *Discourse on Inequality*, Rousseau idolised primitive man, living in a state of nature, with few needs, and criticised as unnecessary much of subsequent material progress: "it is evident that the man who first made himself clothes and built himself a cabin, supplied himself with things which he did not much want" (quoted in O'Rourke, 1994).

1994). This could be done it suggested partly by learning from the resource wisdom of Old Japan, applying the following five principles: "Make allowance for the long periods necessary in the natural cycle; Manage natural resources properly; Do not over-exploit natural resources; Utilise resources with gratitude; and Use what you need in an appropriate quantity."

Within Europe and North America, a powerful ethical challenge to current patterns of consumption has re-emerged. It was Thorstein Veblen who made the first concerted critique of what he called "conspicuous consumption" in the 1890s. Long before the emergence of widespread environmental concern in the 1960s, wasteful consumption had been identified as one of the key characteristics of the post-war affluence, or the "throw-away society" as *Life* magazine put it in 1955. New economists led by E.F Schumacher have ceased to view consumption as good in itself, but merely as a vehicle: "since consumption is merely a means to human well-being, the aim should be to obtain the maximum well-being with the minimum of consumption" (Schumacher, 1973). Duane Elgin's 1981 book, *Voluntary Simplicity* took this approach further, seeking to "bring the quality of simplicity into our levels and patterns of consumption" by learning to "live between the extremes of poverty and excess" (Elgin, 1981). In the run-up to Rio itself, authoritative figures took up these themes. For example, the now US Vice-President Al Gore attacked the dysfunctional nature of the modern world, arguing that it is "addicted to the consumption of the earth itself", and paying the price in the form of "the loss of our spiritual lives" (Gore, 1992).

This renewed ethical concern about the impact of consumer lifestyles was expressed in the evolution of the 'green consumer' movement from negative boycotts towards positive discrimination in favour of more environmentally friendly goods and services (Elkington and Hailes, 1988). Experience has shown the limitations of this essentially voluntary approach to achieving sustainable consumption through the actions of a minority of individual consumers and corporations. There was inadequate trustworthy information on the environmental performance of different goods, a challenge which eco-labelling only partially addresses. Market prices did not include environmental costs, so that green goods were often sold at a premium, rather than being cheaper than polluting products. Inherited stocks of energy, housing and transport infrastructures also prevented action by locking individual consumers and corporations into environmentally damaging practices over which they had little control. But beyond these obstacles was a recognition that the constant creation of new needs and wants within a market economy creates a spiral of desire that could place severe limitations on the prospects for broad-based lifestyle change towards sustainable consumerism.

The central ethical entry point into the sustainable consumption debate is the notion of need. For Consumers International, "the crux of the matter is defining what it is that people really need and what is the most Earth-saving way to meet that need" (IOCU, 1993). Needs stand at the heart of sustainable development. It has generally been used to describe 'basic needs' such as shelter, primary health care and education and food security for the world's poor, to which "overriding priority" should be given, according to the World Commission on Environment and Development (WCED, 1987). Alan Durning of the Washington-based Worldwatch Institute has usefully clustered the world's inhabitants into three consumer classes many of whom have still to meet basic needs (Durning, 1992):



- The one billion High Consumers with an income of over \$7500 per year, living mostly in Europe, North America and East Asia. This billion live off a diet of meat, packaged food and soft drinks, using private cars, an ever-growing range of electric-powered products as well as short-lived, throwaway goods;
- The over three billion Moderate Consumers with an income of between \$700 to \$7500, living mostly in Latin America, the Middle East and China. Their diet is based on grains and water, they increasingly use electric lights, radios, TVs and refrigerators and they travel mostly by bus, railway and bicycle.
- The one billion Under-Consumers, who earn less than \$700 per year, and are living mostly Africa and South Asia. They have inadequate access to the goods and services to meet their basic food, water, shelter and sanitation needs.

The definition of human needs has been a subject of dispute at all times. Conflicting aphorisms from Aristotle to Gandhi are used to justify essentially political positions about nature, number and dynamics of needs: are needs innate or culturally determined; is there a hierarchy of need or are all needs equal. Answering the question of what people really need is therefore both a philosophical and practical minefield. As Francis Fukayama has noted "consumerism and the science of marketing that caters to it refer to desires that have literally been *created* by man himself, and which will give way to others in the future" (Fukayama, 1992). These widely differing perspectives have profound implications for achieving sustainable consumption. For some, the key is to cut back the extravagant and luxury consumption of the rich so that all may meet their needs. For others, the creation of new needs and wants offers a path of liberation from misery and toil, and one which through market-driven innovation and productivity gains is made progressively available to wider sections of society.

Since the early 1960s the phenomenal productivity of modern technology has been a subject of argument in the role it plays in the generation of new desires and demands. Thus, Vance Packard in his 1960 *The Waste Makers* pointed to "a force-fed society with a vested interest in prodigality and with no end in sight to the need for ever-greater and wasteful consumption" (Packard, 1960). In the same vein, economists, such as J.K. Galbraith, argued in *The Affluent Society* that "wants are increasingly created by the process by which they are satisfied...Wants thus come to depend on output. In technical terms it can no longer be assumed that welfare is greater at an all-round higher level of production than at a lower one" (Galbraith, 1959).

There are countless ways in which producers create new wants and desires. Packard listed seven: buying more of the same (eg two cars); buying 'convenient' disposable goods (eg packaging); buying goods that are designed not to last (eg 'planned obsolescence'); buying goods that are less easy to repair; buying additional goods because of the confusion generated by marketing 'razzle-dazzle'; buying extra goods on the 'never-never' through easy credit options; and buying more goods because of the creation of a "permissive attitude for carefree buying" (Packard, *ibid*). There is a sense of *déjà vu* re-reading Packard's suggested courses of action, which ranged from the ethical (eg restoring pride in prudence), through the regulatory (eg introducing quality labelling of products) to the distributive (eg tackling the

unmet 'real' needs of urban renewal, education, health, old age support and development assistance).

Thirty years on, over half of Americans and over 80% of Canadians surveyed recently recognise that 'changes in lifestyle' and 'consuming less' are inevitable parts of solving environmental problems, as people re-visit their needs for products (SustainAbility, 1995). A 1995 survey of American views on consumption, materialism and the environment found that people of all backgrounds believed that materialism, greed and selfishness were crowding out a more meaningful set of values based on responsibility and community (Merck, 1995). They also perceived a general connection between the amount they bought and environmental damage: "there is an intuitive sense that our propensity for 'more, more, more' is unsustainable". But the Americans surveyed were also ambivalent and unsure about what to do, caught between material comfort and non-material aspirations.

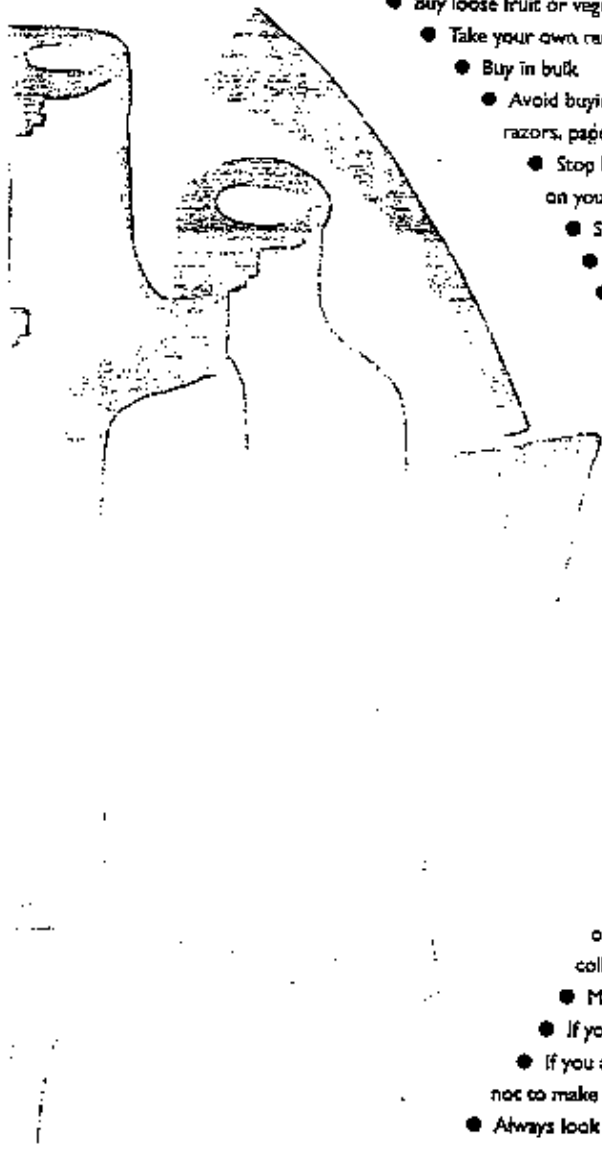
A range of community-based initiatives have emerged in response to this feeling of ambivalence and powerlessness, providing a supportive social framework within which to rethink and change their lifestyles. Internationally, the most well-established programme is the Global Action Plan (GAP), an NGO initiative operating in more than 12 countries. GAP has found that traditional approaches to lifestyle change of offering information and modest incentives were "grossly inadequate in changing deeply ingrained behaviour patterns" (GAP, 1995). GAP's response has been to design the Household EcoTeam programme which provides people with a structured approach that supports them in changing their habits. In the USA, over 8000 households have achieved measured resource savings including a 40% reduction of rubbish sent for municipal disposal, while in the Hague, the Netherlands, average waste savings of 28% have been achieved. The approach is to help households understand their waste streams and support them to take action to reduce, reuse and recycle materials (see Figure 3).

Figure 3 Flyer from Global Action Plan

# The waste challenge



## Reduce the amount you use



- Buy loose fruit or vegetables
- Take your own reusable bags when you go shopping
- Buy in bulk
- Avoid buying disposable items with a short life such as razors, paper handkerchiefs, paper towels and face wipes
- Stop hand-delivered unwanted fliers by putting a sticker on your letter box
- Stop junk mail by writing to the Mailing Preference Scheme
- Consider organic and alternative gardening methods
- Use appliances which run on mains electricity rather than batteries

## Reuse as much as you can

- Buy things which will last and can be repaired
- Use returnable milk bottles
- Don't throw away anything which could be used by someone else – by your children, a playgroup, school or charity
- Look out for products which are sold in packaging that can be refilled – such as washing powders and liquids
- Whenever possible buy reusable products – rechargeable batteries or a solar recharger for instance
- Before you throw anything away, consider whether it might be repaired

## Recycle whenever possible

- Plan to recycle as much as possible – glass, aluminium and other cans; paper and cardboard; plastics and textiles, but only collect materials that can be recycled in your area.
- Make a compost heap – one third of waste is compostible
- If you don't have a large garden, try vermiculature (worm bins)
- If you are taking anything by car to be recycled, remember not to make a special trip
- Always look for products made from recycled material, such as toilet paper

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**Reduce your waste by 25%**

A similar approach is taken by the Norwegian Environmental Home Guard organisation which looks to change the consumption patterns of ordinary people by taking an optimistic solution-oriented approach, using simple and direct language, including humour, integrating cultural activities (such as theatre and music) and establishing personal relations with the target population. The Home Guard work with mainstream environmental organisations, as well as the church, housing associations, scouts and guides, and sports groups. Its 10-point pledge contain a range of activities to minimise household waste. The Home Guard has already identified a range of obstacles to practical progress, including poor systems for waste separation, collection and recycling of materials; inadequate environmental information on products; low priority given to durable products; low cost of waste disposal; the failure to include the cost of waste management in disposable products; and increased advertising through direct mail.

But aspirations to consume in a more sustainable way also have to be distinguished from actual behaviour. In Norway, for example, "The Future in Our Hands" movement was launched in the 1970s with the goal of pioneering reduced consumption and simpler lifestyles. Original members were deliberately chosen from "the great and the good", who committed themselves to simpler lifestyles even though they had above-average incomes. Research comparing actual consumption patterns of these pioneers with the average population revealed that they had a higher proportion of cars and dishwashers and lived in larger houses or flats (Strandbakken, 1995). Rather than being an indictment of hypocrisy, these findings highlight the degree to which an individualistic and often moralistic approach comes up against both structural constraints to change (such as a lack of recycling facilities or options for public transport) and the reality that consumption patterns are largely determined by income.

Mental perceptions of environmental problems can also differ substantially from material realities. In the USA, a survey of environmentally-minded participants at a National Audobon Society meeting produced off-the-cuff estimates of the total municipal waste made up by certain high-profile wastes, such as fast-food packaging and disposable diapers of 20-30% and 25-45% respectively (Rathje & Murphy, 1992). In fact, fast food packaging made up less than one-half of one percent of the weight of materials in landfill, while diapers make up no more than one per cent of landfill waste by weight. Basing policy on perceptions can therefore be ineffective or indeed counter-productive, particularly if the targets are symbolic rather than substantive environmental problems.

The next chapter turns from the general to the particular and shows how these three perspectives on sustainable consumption have been played out in the paper cycle.

### **3. THE SUSTAINABILITY OF PAPER CONSUMPTION**

#### **3.1 *The Evolution of Paper Consumption***

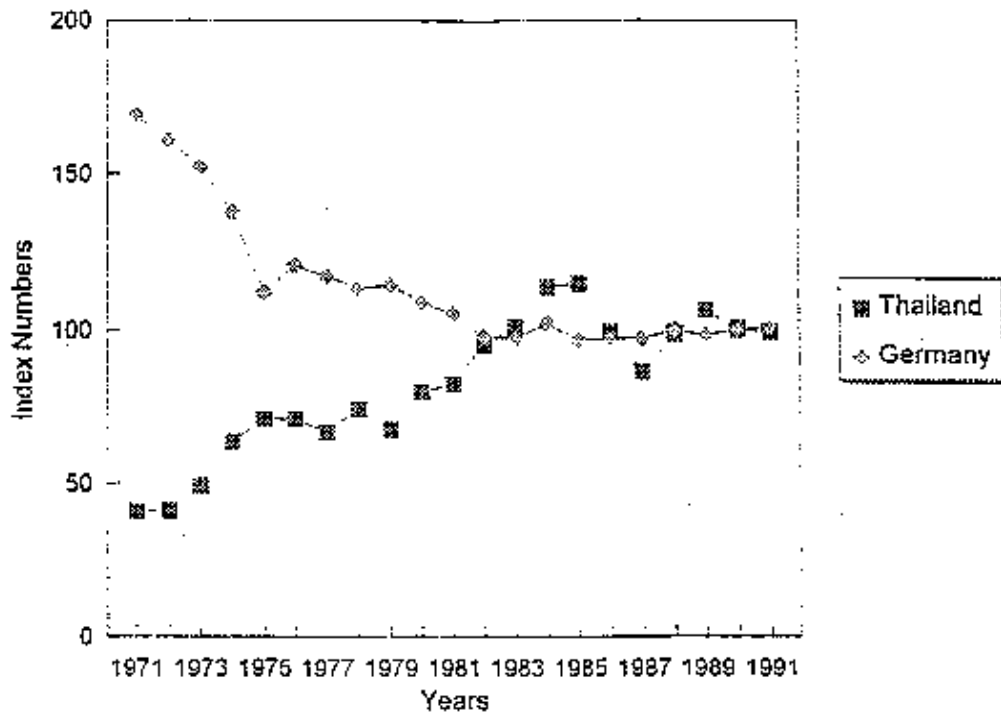
Global paper consumption has increased nearly 20 times during the twentieth century, with most of the growth occurring in the last 30 years (Taiga, 1995). This consumption explosion has taken place mostly in the North. In the USA, by far the world's largest consumer of paper, per capita consumption tripled between 1900 and 1936 from 17 kg in to 56 kg in 1936; by the middle of the 1950s, per capita paper use had tripled again to reach 175 kg, and it now stands at over 308 kg per person each year. By contrast, the average paper consumption by each citizen of the world (45 kg in 1992) has yet to reach that achieved by the average American in 1936. Average African consumption still languishes at 5 kg each year, and in some countries, such as Mali and Somalia, is about 0.1 kg per capita, equivalent to pre-industrial levels in Europe (Lines & Booth, 1992). This consumption gulf can be explained by the long-established culture of paper consumption in North America and Europe, sharp differences in per capita income and wealth, relative costs of paper and levels of literacy. Environmental policies have yet to have a marked impact on paper consumption levels.

The uses to which paper is put have also grown, expanding well beyond the books and writing materials with which it is most closely associated to include packaging and personal care applications. As a result, in terms of global averages, the largest use of paper is now in packaging (40%), followed by printing papers (30%) and newsprint (13%) and finally tissues (6%); this breakdown can vary considerably between different countries. The expansion of paper uses reflects the forces of affluent individualism, the success with which paper has displaced other materials (eg cloth diapers and handkerchiefs) and structural change towards an information-based economy. Paper products are also becoming ever more sophisticated, with increasing emphasis on quality, service and engineered products, and a move away from a commodity mentality.

The much-heralded paperless economy has not yet arrived. In fact, the move from an industrial to information-based development has so far stimulated increased paper consumption. It is significant that in the 1980s when the diffusion of personal computing began to transform commercial and administrative practices that the amount of paper required for each unit of growth stabilised, rather than continue to decline along with energy and steel use (see Figure 4).

This explosion in paper consumption has come at an environmental cost that many regard as excessive. Paper consumption is now firmly linked in the popular mind to a range of priority environmental problems, and reducing paper consumption forms a key element of many community-based environmental initiatives, such as the Global Action Plan. The situation is such that the German publishing house Axel Springer sees a central part of its environmental strategy as countering their readers' "bad feeling when buying newspapers and magazines", according to its environmental officer, Florian Nehm (Nehm, 1995).

Figure 4 Consumption Intensity of Paper 1971-1991



Until recently environmental agenda for paper consumption concentrated on recycled content and bleaching technologies. Recently, new issues from the wider sustainable consumption agenda have come to the surface, and have started to coalesce around three key questions:

- Are there Environmental Limits to Global Paper Consumption?
- Is Paper Consumption Eco-Efficient?
- Are Paper Consumption Needs being Met?

### 3.2 Are There Environmental Limits to Global Paper Consumption?

The rapid expansion of paper consumption in Asia and the continuing growth in the North provides the global context for assessing the sustainability of future paper use. Geoffrey Elliot of Noranda recognises that "the environmental challenge in our business is meeting this growing demand, while ensuring that commercial use of wood fibre extracted from global forest resources is sustainable" (Elliot, 1995). According to Skogsindustrierna, the Swedish Pulp and Paper Association, "the need for paper products is virtually insatiable in the third world. Not least, there is an acute shortage of protective packaging" (Skogsindustrierna, 1994). But this insatiability is matched by growing forest stocks, according to Skogsindustrierna Director Nils Jirvall: "Our forests are growing much faster than the rate at which they are being used. There is no reason at all to economize on the use of wood and paper products -- at any rate not if the reason is to save the forest" (Jirvall, 1994).

But others in government and the environmental community are less sanguine about the ability of available forest resources to keep up with demand. Heinrich von Lersner, President of the German Environment Agency, believes that "globally, the lack of wood will soon become a reality", adding that "this is the topic over which environmental protection and the paper industry have entered into an inevitable conflict (ie the avoidance of unnecessary paper consumption" (Lersner, 1995).

Environmental groups are also developing their own scenarios for sustainable consumption. Greenpeace has asserted that "If we continue to consume paper at the present rate, and encourage developing countries to use the same amount of convenient disposable products, then the world's forests will be depleted within the next few decades" (Greenpeace, 1990). A more recent study from Friends of the Earth UK, for example, concludes that the projected growth in global demand from 1.6 billion m<sup>3</sup> to 2.7 billion m<sup>3</sup> by the year 2010 will spell "almost certain doom for most of the world's remaining forests" (Friends of the Earth UK, 1995) <sup>(5)</sup>. The Taiga Rescue Network, which monitors forest conservation in boreal areas, has reached a similar conclusion: "if paper consumption in the affluent countries is allowed to grow, we will very soon reach the limits of ecologically sustainable timber harvest on a global scale" (Taiga, 1995).

There appear to be two irreconcilable visions of sustainability of future paper consumption here. One in which forest resources grow in line with expanding demand, and the other in which demand outstrips supply. In the one, the resource limits to consumption appear flexible and upwardly expandable, while in the other the forest stock faces real constraints. Added to this essentially quantitative concern is the more qualitative focus on the nature of forests under management, and in particular the levels of biological diversity.

These new arguments that there are limits to paper consumption emerge out of the application of the concept of 'environmental space' to the paper sector. In its 1992 *Sustainable Netherlands* report, Milieudefensie used a set of environmental and social assumptions about

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<sup>5</sup> Efforts to cut paper consumption as a way of reducing pressure on forest resources need to be seen in context. Only about 25% of the 1.6 m<sup>3</sup> of total roundwood production is used directly for pulp. If sawmill residues are added, then the total pulp and paper share is still less than 40%.

sustainable forest management in 2010 to estimate an acceptable level of global consumption. These assumptions include the halt to logging in old growth forests, sustainable wood extraction and equal distribution of wood products. The impact of taking out of possible production old growth forests, overcoming the grave inequalities in paper consumption and allowing for population growth in the South results in a need to cut paper consumption in the Netherlands by over 60% over the next 15 years. Milieudefensie then identified a range of savings in the consumption phase, such as the reduction in paper waste, 'junk mail' and disposable paper products (such as diapers, handkerchiefs and packaging).

The need for substantial reductions in paper consumption flow inevitably from the assumptions made by Milieudefensie. Other assumptions about forest management and what constitutes fair distribution would yield different results. Consequently, the answer to the question of whether there are enough trees to satisfy rising demand for paper depends on the criteria adopted for sustainability. These can never be absolute or uncontested. What is striking about the approach adopted by Milieudefensie and others is not their assumptions for forest management, which are long-standing environmentalist demands, but the new emphasis on the fairness in paper consumption (see Section 3.4).

### 3.3 *Is Paper Consumption Eco-Efficient?*

Increasing the eco efficiency of resource use is one of the driving perspectives behind sustainable consumption. It has also been central to new waste management strategies that focus on reducing the generation of waste at source (Marcin, Durbak & Ince, 1994). Paper is the single largest component of municipal solid waste, made up of corrugated cardboard, newspapers, office paper and packaging. In a survey of the British public carried out in 1994 by the Pulp and Paper Information Centre, excessive packaging was listed as the greatest source of wasteful or unnecessary use of paper, followed by unsolicited mail, photocopying in offices and newspaper supplements. To date, considerable attention has been focused on reducing the waste generated by high-profile waste streams, such as diapers and packaging.

Disposable diapers are a powerful test case for sustainable consumption. They are a symbol of the 'throw-away' society, and highlight the degree to which disposable paper products have successfully become substitutes for traditional, more durable options, despite costing more. There is a significant moral dimension due to the association with the well-being of children. Diapers also often come top in opinion surveys of public concern about garbage volumes, although they represent a tiny proportion of total waste.

Diapers have also been the focus of competing life cycle assessments, financed by both disposable and reusable diaper interests, such as Procter & Gamble and the US National Association of Diaper Service Industries. These have produced a very mixed picture of the relative benefits of each. For example, a 1993 study by the University of British Columbia for Procter & Gamble found that "cloth diapers consume less raw materials and produce less solid wastes, while disposable diapers use less water and produce less waterborne wastes" (UBC, 1993). Procter & Gamble has concluded that "neither diaper system can claim to have a superior environmental profile" (P&G, 1994). Environmental groups continue to campaign for a shift back to reusable diapers as a way of reducing pressures on forests, cutting pollution from chlorine bleaching and reducing solid waste (WEN, 1994).



But the debate is still confined to affluent societies. Extrapolations of the sustainability implications of extending the diaper use of the one billion living in the North to the other six billion people likely to be alive early in the next century have yet to be made.

Likewise, paper packaging has also become an immensely symbolic arena for competing notions of what is wasteful consumption. Packaging is highly visible, and accounts for a high proportion of household waste (for example, 50% by volume in Germany), but only 1% of total waste (including the agriculture, industrial and construction sectors). For consumers packaging is an intermediary good, a case of 'involuntary' consumption that facilitates more convenient lifestyles. Historically, environmental considerations have had a low profile in packaging design, with other factors such as product protection and hygiene, distribution, saving labour, sales promotion and stock control, coming to the fore. One consequence of this, according to William Rathje, is that "it seems to be taken for granted by many that packaging is inherently wasteful", himself admitting that "one must concede, some packaging, even a lot of packaging *is* excessive" (Rathje & Murphy, 1992).

A theme running through recent European efforts to control packaging waste has been a desire to cut down on this "unnecessary" packaging, particularly outer secondary packaging (for example, blister packs and boxes around toothpaste tubes). In the Netherlands, a packaging 'covenant' was signed in 1991 by the government and the actors along the 'packaging chain' (raw material suppliers, manufacturers, distributors, retailers, waste companies). The covenant was designed to implement the principle spelled out in the NEPP that "anyone introducing a product into the market is also responsible for that product when it becomes waste" (SVM, 1991). The covenant set a range of targets which the packing industry undertook to achieve, including the reduction of the quantity of packaging (in kilotonnes) to 1986 levels by the year 2000, as well as the development of new packaging concepts, the introduction of lighter materials, the avoidance of "excessive" packaging and the avoidance of multiple packaging.

In Germany, the Waste Avoidance and Waste Management Act enables the government to require the compulsory take-back of discarded products. Under this general umbrella, the 1991 Packaging Ordinance required manufacturers and distributors to take-back packaging materials, and to recycle and re-use them outside of the public waste disposal system. To meet this challenge, companies from the retail trade, consumer-goods industry and packaging industry joined to form the Duales System Deutschland (DSD). Producers pay for a Grüne Punkt (green dot) according to the weight and volume of their packaging, which entitles them to have their packaging collected, sorted and recycled. The Green Dot fee not only finances the DSD's parallel waste management system, but it has also stimulated the reduction of packaging waste by forcing producers to optimise packaging from an ecological perspective (for example, by using returnable containers). As a result, the use of packaging in Germany fell by one million tonnes between 1991 and 1993. Not surprisingly, the DSD system has proved highly controversial, with complaints about its cost effectiveness, and serious trade and economic problems emerging, due to the emphasis on materials collection. To counter this, Ernst von Weiszaecker, President of the Wuppertal Institute and former chair of the DSD's advisory board is urging a shift to taxing primary commodities to further shift the balance towards waste minimisation.

In both the Netherlands and Germany, raising the cost of packaging and extending the responsibility of producers and retailers to include 'take back' requirements has prompted a wave of 'ecological optimisation' and innovation, reducing "unnecessary" packaging in the process (DSD, 1992). A survey of German business in 1992 found that "every fourth company intends to completely eliminate all packages which are not necessary to protect the goods": a number have already dispensed with plastic blister packaging (DSD, 1992). In the Netherlands, the retailer Albert Heijn has developed new packaging for boxes of chocolates that remove the need for plastic inserts, cutting the weight of packaging by almost half (Milieudefensie, 1994). While in some instances, the use of paper as a packaging material has benefitted from increased attention to environmental factors, in others paper has itself been substituted by plastics on environmental grounds. For example, the Swiss retailer Migros has switched to the use of plastic pouches instead of paper Tetra-briks for packing milk following an eco-balance assessment.

But producers have always had some incentive in the form of the cost of materials to keep packaging to a minimum. Twenty years ago, John David, Director of Environmental Control at General Foods stated in 1975 that "every effort is being made to minimize waste by eliminating excessive packaging material" (quoted in Hirshhorn & Oldenburg, 1991). More recently, companies have started responding to increasing regulatory and public pressures with commitments to reduce their use of packaging. The US consumer products company S.C Johnson has set a target of reducing the amount of virgin materials in its packaging as a ratio to formula weight by 20% by the end of 1995 (S.C. Johnson, 1994). In Europe, another consumer goods company, Procter & Gamble, has set a specific goal for reducing the volume of paper packaging waste from its products by 20% between 1991 and 1995; by 1993, it had already saved 30% of its paper packaging waste (Procter & Gamble Europe, 1993). Three case studies of how one paper company has cut resource use in its packaging applications while improving the end-use performance are provided in Box 3.

Business is resistant, however, to efforts to force the pace of source reduction through regulation. Thus, the Canadian Pulp and Paper Association in its statement on solid waste management supports "market-driven source reduction" through the use of "lighter weight, more compact, less elaborate packaging and reusable containers where possible"; but states clearly that it "opposes legislated packaging material reduction schemes (taxes, penalties, bans, etc). The CPPA justifies this opposition on the grounds that "legislative approaches are inefficient, unnecessary and can generate increased waste through insufficient protection and contamination of packaged products" (CPPA, 1994).

## BOX 2 - ECO-EFFICIENT PAPER USE: 3 PACKAGING CASE STUDIES

\* *Liquid Packaging:* Clearly understanding the end-use performance requirements for packaging materials can help to generate substantial savings in paper use. In one case, the paperboard required for packing liquids such as milk and juices has been cut by 10%, with a further 10 - 15% reduction possible over the next five years. The redesigned paper board uses three plies instead of one, which are carefully manipulated to produce the desired performance. Fibre use has been reduced as a result, along with energy consumption, while end-use performance has been improved. These results were achieved through the application of scientific and engineering concepts, upgraded equipment technology and suitable fibres developed through collaboration between a paper machine manufacturer, a research institute and two board manufacturers over a 10 year period.

\* *Containerboard Packaging:* Traditional product specifications can act as a barrier to efficiency improvements. Until recently US standards for shipping containers by railroad or truck dated from the 1920s and specified both container weight and performance requirements. This gave no incentive for efficiency improvements through weight reduction. During the 1980s, changes in manufacturing equipment through the introduction of the extended nip press (ENP) enabled the production of a board that is 15% lighter than standard, using less energy in the drying phase. New shipping rules have now been introduced that eliminate the weight requirement and use new criteria to measure package strength. This has opened the door to lighter weight, better performing packaging. Box designers have taken advantage of the rule changes, and have linked these with the shift towards increased automation.

\* *Diaper Packaging:* Reducing product volume can lead to resource savings both for the product itself and its packaging. The baby diaper industry is moving to thin diapers, which involve a 40% reduction in volume of the diaper and a larger cut of 50% cut in the amount of packaging required for the same number of diapers. The diaper volume reductions are achieved through adding superabsorbent polymers (SAP) and removing some paper fiber, and densifying the diaper core to make it thinner. The lower volume has reduced freight costs by 30-40% since trailer trucks have been volume limited but never weight limited for diapers. Future trends are for even thinner diapers, perhaps with an additional 50% volume reduction, bringing further opportunities for packaging material reduction.

*Source: Weyerhaeuser*

Moves to make packaging lighter and eliminate unnecessary packaging inevitably bring the discussion of paper consumption around to the efficiency of use. Like energy efficiency, there are a number of overlapping reasons for improving the efficiency of paper consumption, in particular reducing pressure on raw materials, cutting waste and saving money (Nordman, 1994). Taking action to become more paper efficient means tackling the historical trend of continued growth in paper use. But this goes with the grain of recent efforts to improve the environmental efficiency of business and government procurement practices by identifying the real needs that paper use serves.

The consumption of office paper is growing at more than twice the rate of overall economic growth, while paper industry projections point to annual increases in paper use of up to 13% for the average business (Lof, 1989; AT&T, 1992). This surge in paper consumption is being driven by advances in office computing, printing and copying technologies: "a computer with a printer is, in effect, a printing press, and there are now 55 million of these printing presses in American homes and offices, where 20 years ago there were only typewriters" (Rathje & Murphy, 1992). The numbers of copy machines and printers are expected to rise further during the rest of the 1990s: in Europe alone, the number of photocopiers is expected to grow by more than 50% between 1993 and 1997 (Thoren, 1995).

Bucking this trend is not easy, partly due to the lack of priority placed by most office paper users on collecting basic information on paper volumes, costs and reduction options for environmental management purposes. However, there are now growing number of office paper users that are setting and achieving impressive reductions in consumption.

In the USA, AT&T has been a pioneer in finding ways to cut its use of paper in its business operations. In 1990, AT&T set a corporate goal for a 15% reduction in paper use by year-end 1994. A Paper Reduction Team was established, headed by a representative from the purchasing division because "the purchasing of paper was the true monitoring device of paper usage and the barometer by which the team could measure its efforts". The team identified various "fat rabbits" which used large amounts of paper, and worked with these to gain commitments to reduce consumption through a variety of methods, including double-sided copying and using electronic mail. For example, AT&T Reprographics negotiated contracts with discounts for double-sided copying. By the end of 1994, AT&T had managed to reduce paper usage by 29%, almost double its target, with large financial savings (AT&T, 1994).

### *3.4 Are Paper Consumption Needs Being Met?*

There is no disagreement that paper consumption should rise substantially in developing countries. Although the world average per capita consumption in paper has reached 45 kg per year, most developing countries are still far below the estimated level of 30-40 kg of paper per capita required each year to meet basic needs of literacy and communication (Radka, 1995). One estimate suggests that world paper production would need to rise by approximately 70% simply for the Third World to reach developed world per capita paper consumption rates in 1900 (Becker, 1989).

Deep inequities in income and education help to explain this North-South divide. More than a billion adults are still illiterate in the developing world, and over 100 million children

worldwide receive no primary education (UNDP, 1991). Many of the post-independence literacy achievements have been put at risk over the past decade as developing country governments have found themselves unable to pay for public education, due to huge debt burdens and resulting austerity programmes. As a result, school enrollment rates actually stagnated or fell in the 1980s in some countries. For example, primary enrolment rates fell from 93% in 1980 to 66% in 1987 in Tanzania (World Bank, 1991). External aid to the education sector did not pick up the slack, falling from 16.5% of total bilateral aid expenditure in 1979 to 10.7% in 1989. Educational assistance was also heavily skewed towards higher education, with only 20% of international assistance going to primary education, the key for basic literacy.

UNCED reaffirmed earlier UN recommendations made at the 1990 World Conference on Education for All to universal access to basic education and halving illiteracy rates, estimating the cost of this programme at about \$8 to \$9 billion each year, including about \$3.5 to \$4.5 billion from the international community in the form of aid. In the run-up to the 1995 Social Summit in Copenhagen, the United Nations Development Programme called for agreement around a compact for human development. This compact would include a commitment to achieving a target of basic education for all, of reducing adult illiteracy reduced by 50%, and ensuring that female illiteracy was no higher than male (UNDP, 1994). The additional costs of this were estimated at \$5-6 billion a year, which would be achieved through redirecting domestic budgets in developing countries away from the military and prestige projects so that at least 20% of public spending went to human development, combined with a corresponding reallocation of aid so that 20% went to human priority goals, including education. However, this 20:20 compact received a lukewarm response at Copenhagen itself, and there is little sign in the near future of either a renewal of overall commitment to aid funding in donor countries or of a redirection towards basic goals such as education.

But the under-consumption of paper extends beyond the sphere of communications. Many in industry point to the lack of sufficient protective packaging in developing countries, causing health and waste problems. Hans Rausing, Chairman of Tetra Laval, compares Mexico and America: "Mexicans are poorer than the Americans and use less packaging. That is the reason why the average Mexico City household produces 43% more waste than the average American one...We need more packages in the world not less" (Rausing, 1993). This interpretation of needs is challenged by environmental and community groups in the Third World. WALHI in Indonesia argues that expanding paper production is "largely funnelled into extraneous products which in turn are absorbed by that segment of the market which has already fulfilled its basic paper needs" (WALHI, 1992). In response, WALHI argues that paper being used for "throw-away products such as paper cups, napkins towels, packaging and disposable diapers should be redirected towards durable paper products, such as school books, which have more long-range benefits for a larger segment of the Indonesian public". The Centre for Science and Environment in India also argues for action to discriminate between paper for printing and writing ("a necessity") and industrial paper for packaging and personal care ("a luxury"), which should be discouraged through economic instruments (CSE, 1995).

The current distribution of paper consumption is based on the balance between actual demand and supply within the world market. It has long been recognised that education is one of a number of public goods which require government action to achieve universal access.

Governments have therefore intervened indirectly to stimulate demand for paper consumption in the education. Tackling the scandal of continuing illiteracy in the South -- perhaps the most glaring and non-environmental sustainability gap facing the paper cycle -- will therefore require a joint commitment from governments in North and South to give priority and resources to education. Efforts to alter the balance between paper uses according to whether a particular application is a necessity or a luxury stray into the philosophical minefield that surround all questions of need, and could prove unmanageable in practice. This does not of course mean that developing countries should not employ economic instruments to achieve sustainable paper consumption, but to be credible these instruments will need to be linked to particular environmental problems such as increasing municipal waste.

In the North, issues of need are also being raised both in terms of the volume and type of paper being consumed. Even back in 1974, one US magazine asked, "what customer asked for a dazzling white and bright sheet in the first place? Who knows. And who needs it?" A recent US study has shown that "there are significant differences in resource use for a given type of paper with different degrees of brightness" (Bower, 1994). The study makes the distinction between functional and aesthetic properties of paper, and argues that a large degree of paper bleaching is for essentially cosmetic purposes, whose environmental implications, particularly in terms of energy and water consumption, are not understood by consumers. In Europe, a leading environmental consultancy, SustainAbility, has argued that the "need test" is becoming an important complement to traditional, more environmentally-driven management tools such as life cycle analysis (SustainAbility, 1995).

#### 4. CONCLUSIONS: WAYS FORWARD FOR SUSTAINABLE PAPER CONSUMPTION

Sustainable consumption is often seen as an umbrella concept that brings together a number of hitherto separate environment and development issues. This study has attempted to delineate what lies beneath this umbrella and has found a highly contentious struggle of competing answers to three fundamental 'what if ?' questions:

- What would happen to the world's consumption of environmental resources if certain limits existed and certain radical principles for distributing these resources were adopted?
- What would happen to the world's environment if producers provided and consumers used more eco-efficient goods and services?
- What would happen to the world's environment if consumers applied a different set of ethical principles to their choice of goods and services?

These three questions overlap in many ways. Ethics as we have seen ultimately informs the definition of limits; eco-efficiency is also driven by a new ethical response to the environmental challenge from a limited number of global corporations. Similarly, an ethical approach to consumption patterns involve notions of limits and distribution, while to be useful, eco-efficiency must also give entrepreneurs a sense of the scale of change required, which again requires a notion of limits.

Based on this analysis of the emerging and still embryonic sustainable consumption agenda, 10 critical factors can be identified, around which different perspectives coalesce and compete.

- (i) *Environmental Limits:* One starting point is the definition of assumptions that underlie competing understandings of the potential environmental limits to consumption. To date, these range from the 'strong sustainability' arguments of Friends of the Earth, through the 'weak sustainability' position of most OECD governments to the 'very weak sustainability' position of conservative Wise Use advocates. Honesty and clarity about different assumptions of limits would be a great step forward in debates on the paper cycle.
- (ii) *Equity and Distribution:* If some form of change is required given these differing visions of sustainability, then the question of equity or fair distribution becomes an issue. Again a range of options is available, with the equality of resource use position of Friends of the Earth the most developed. However, other equitable outcomes are possible, including one which emphasises market distribution as fair, and one which rejects formal equality, but argues for a minimum safety net for all.

For the paper cycle, the inequality in paper consumption between North and South is perhaps one of the most striking – and non-environmental -- sustainability gaps that now needs to be bridged. To do this will require a reinforcement and redirection of international assistance towards primary education and a reform of government

priorities in developing countries in particular to reduce defence and prestige spending.

- (iii) *Ethics:* The sustainable consumption agenda is shot through with value judgements about 'good consumption'. Few of those who propose a more ethically-based pattern of consumption have admitted to either the conceptual density of the issue of 'needs' or to the difficulty in post-modern liberal democracies -- where all lifestyles are seen to be morally equivalent -- in reaching consensus on ethical positions. But it is also naive to see the market as a place should not intrude. Greater sophistication is thus required from all sides on how, for example, to define what needs paper use really serve. A focus on the morally saturated debate on direct marketing/junk mail could be a useful starting point.
- (iv) *Needs & Services:* The issue of needs, despite all the conceptual problems, does provide a useful point of departure for devising more sustainable patterns of consumption. New procurement policies are forcing institutional consumers to become more aware of their true paper requirements; cost and environmental pressures are driving companies to set goals for reducing paper consumption; and community-based initiatives are supporting households to redefine what they mean by need. All these forces are likely to require a diffusion of the more sophisticated response from the paper industry illustrated in the case studies, one that moves away from a bulk, commodity focus on volume to a solution orientated approach that seeks to meet a consumer's packaging, communications or personal care needs, even if this means selling less paper.
- (v) *Innovation:* One area where the mainstream sustainable consumption agenda differs markedly from earlier discussion on 'limits to growth' and 'voluntary simplicity' is in its more positive approach to the innovative potential of the market. Primitivist visions of sustainable consumption remain, but these are likely to be limited in appeal to a minority. This new respect for innovation should not be confused with agreement with the current results of unrestrained, market-led innovation. Most advocates of sustainable consumption see an urgent need for change, but agree that this change needs to take place within a market context. The real dividing line has moved to how innovation can be steered so that the bulk of consumption becomes more efficient and less polluting.
- (vi) *Regulation:* Steering the market requires government intervention through regulation. The scale of intervention required to deliver the 'strong sustainability' goals proposed by Friends of the Earth appear at odds with the worldwide move to open markets, deregulation and the rejection of planning. Indeed, there is a conservative case that can be made for less government intervention as a starting point for sustainable consumption, focusing on the removal of the 'perverse subsidies' in the agriculture, energy, forest and transport sectors to stimulate increased production at the cost of extensive environmental damage. Business proponents of eco-efficiency are split on the benefits of regulation. While some use eco-efficiency as an argument for a voluntary approach to environmental improvement, others recognise that substantial intervention could be required, particularly to reform fiscal and pricing structures. In



terms of paper consumption, this last approach could mean the introduction of virgin material fees as a stimulus to eco-efficiency.

- (vii) *Population*: An often unstated factor in discussions on sustainable consumption is the question of population growth. Most of the supporters of radical action in favour of sustainable consumption view projected population growth rates as a given, and seek to manage consumption accordingly. However, this could give a "perverse incentive" to countries with fast-growing populations to abandon family planning efforts in order to gain a larger slice of environmental space. The sustainable consumption agenda therefore needs to be pursued in close coordination with population policies, which since the Cairo Conference on Population and Development have moved far from earlier top-down approaches to growing populations in the South.
- (viii) *Responsibility*: Sustainable consumption is an issue that brings together a host of social and economic groups, in particular governments, business, consumers and scientists. A central theme is the redefinition of the boundaries of responsibility for environmental damage. In Europe, this has resulted in governments relinquishing their historical responsibility for waste management, and making producers accept the duty for managing the waste generated by their products. Although the paper industry has been at the forefront of developing an 'eco-cycle' response, issues such as the responsibility of business for stimulating increased consumption through marketing and advertising remain unresolved.
- (ix) *Costs and Benefits*: The sustainable consumption agenda has been largely immune to the rigorous application of economic cost/benefit analysis. It is noteworthy that although Milieudefensie's alternative *Action Plan: Sustainable Netherlands* was in part a reaction to the Dutch government's costed National Environmental Policy Plan, the environmental space approach has not yet been subject to economic assessment. Indeed, sustainable consumption can be seen as one of the few examples in the international environmental policy arena where an economic approach has yet to be applied systematically, and where values remain dominant.

The three different approaches are also more or less amenable to economic analysis. The strongly quantified 'planning for sustainability' approach could thus be subject to cost-benefit analysis, but this has yet to be carried out. Quantifying the costs and benefits of the 'eco-efficiency' approach is more difficult, and potentially circular, since by definition eco-efficient activities are cost-effective for business. The 'ethically-driven' sustainable consumerism approach explicitly rejects economic calculation as legitimate, and is perhaps unquantifiable in its impacts.

- (x) *Uncertainty*: Most discussions of sustainable consumption remain in the realm of answering 'what if?' questions, and have quite different responses to questions of uncertainty and unpredictability. Here, again the Milieudefensie "equity scenario" is the most developed attempt to respond to possible conditions in the future generated by economic development, population growth and technological change. Rather than relying on flawed predictive models, some companies have used a similar approach of scenario planning to stimulate internal thinking on how they would respond to different futures. The complexity and unknowability of the sustainable consumption

agenda means that this scenario planning approach is particularly important to uncover blind spots and broaden perspectives on competing options.

These then are the major conclusions of this enquiry into sustainable paper consumption.

The agenda is a new one, and one which is still largely at the 'problem definition' stage: only a few governments, companies and communities have gone to the next stage of making their visions of sustainability operational. A priority area for further work is therefore the clarification of the differing visions of sustainable paper consumption. This could build on the pioneering scenario building exercise carried out by the European Partners for the Environment organisation which brings together European governments, businesses, labour unions, environmental organisations and research institutes to develop a shared response to the challenge of sustainable development (EPE, 1994). Three possible scenarios for sustainable consumption are given in Box 3. The clear message is that the future for paper consumption will certainly be very different from today.

Already some 'win-win' options for more sustainable paper consumption can be picked out, notably the introduction of paper procurement guidelines and paper use reduction strategies by institutional consumers, and the development of community-based initiatives for paper consumption by households. These options are all aimed at helping consumers to define and meet their needs more efficiently. A wide diffusion of best practice in these areas would lead to a reduction in the volumes of paper used, increased consumer satisfaction and higher margins for those paper companies able to meet more sophisticated paper needs.

The provision of clear, precise information on the environmental implications of different paper consumption choices is another precondition for action. The eco-label impasse that started this study is an object lesson in how difficult this is to achieve. The recognition of a basic consumer "right to know" the environmental performance of different paper products is still a long-way off, and can never be achieved through voluntary award schemes such as eco-labelling. Ultimately, universal, mandatory labelling could be required to set a level-playing field for consumers.

If sustainable consumption is really the environmental wave of the future, then the task for today is to clarify the assumptions that underlie different visions of the future. Until this is done and the various stakeholders in the paper cycle sit down in a climate of mutual respect, then answering the question, *What on Earth is Sustainable Paper Consumption?* will remain a game of competing assertions with no end in sight.

### BOX 3 - THREE SCENARIOS OF SUSTAINABLE CONSUMPTION

Looking at the paper cycle, three possible scenarios can be constructed, giving equally coherent, but different desirable visions of a sustainable future: *Fair Shares*, *Eco-Efficiency* and *New Worlds for Paper*.

*Fair Shares*: This scenario is well-exemplified in 'environmental space', the approach developed by Friends of the Earth. The central theme of this scenario is that consumption has to be kept within environmental limits (defined in terms of 'strong sustainability'), and that limited resources should be shared fairly between current and future generations. Great stress is placed on local management of resources and on increased self-reliance. Priority is given to meeting basic needs (such as literacy). Wasteful and unnecessary consumption is targeted for reduction (eg 'junk mail'), and the escalation of needs through advertising is challenged. The emphasis is on largescale shifts in lifestyle, buttressed by considerable government intervention to assign consumption rights. New metaphors of paper quality emerge ('grey is good') and non-wood substitutes are promoted.

*Eco-Efficiency*: This scenario is less well developed, but is emerging as the favoured response by OECD governments to sustainable consumption. The central theme of the Eco-Efficiency scenario is the need to manage wisely the supply side in such a way that a package of industrial development, employment and environmental targets can be met. Environmental limits are viewed as potentially serious, but manageable through improvements in technology and institutions. There is a 'weak sustainability' constraint, and an explicit recognition that environmental goals (such as the conservation of biodiversity or the maintenance of primary forests) can and have to be traded off against social and economic goals. These trade-offs are achieved through consensus-based planning. Change is incremental where necessary, and there is no need for a radical change in the distribution of paper consumption or of lifestyles. Equity is achieved by minimising the losers of any change. Modest economic incentives are provided for improved efficiency, but no attempt is made to make a full-scale 'internalisation' of environmental costs.

*New Worlds for Paper*: This is the least well-developed of the scenarios, and is based on an individualistic, market-based vision of the world that has very different assumptions. The central theme is the recognition that consumption needs are upwardly dynamic, and that structural change is the norm for both production and consumption. Opportunity drives consumption, and market-driven development will produce sufficient de-materialisation to ensure that environmental limits (if they exist) remain distant; equity is achieved through the diffusion of productivity gains. The focus is therefore on sustaining and enhancing the services that are currently provided by paper to an expanding range of consumer groups. The intensity of forest management increases, and values are given to alternative uses of forest lands. There is thus no vested interest in paper as such, and paper is used only to the extent that other materials (electronic media or plastics) are less competitive. Policies focus on removing perverse subsidies for resource use and maintaining open markets by combating concentration in the paper industry.

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