

## Responsibility

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### Abstract

The concept of responsibility was addressed in philosophy in particular by Aristotle, Kant and Weber. This concept offers an overview of the philosophical understandings of responsibility, building up an approach that can deal with high complexity, the occurrence of novelty and irreducible ignorance.

When dealing with responsibility, Mainstream Economics limits itself to responsibility for an individuals' wellbeing. Ecological Economics, however, focuses on responsibility for society and the environment as well.

What is responsibility? Responsibility causally links the consequences of an action to the actor. Legal responsibility must be distinguished from moral responsibility. We differentiate individual responsibility from collective responsibility. Finally, we introduce political responsibility and political-ethical responsibility. Ascribing responsibility in this differentiated way helps reduce complexity, for it shows who is responsible for what and to what extent. This allows us to distinguish between reality and wishful thinking. The added value of this concept is that it presents different dimensions of responsibility. Further, it allows us to analyse complex environmental and resource issues.

The examples of joint production, like water pollution, lead to an important conclusion: A top-down approach does not suffice to deal with environmental problems. We need a bottom-up approach: Individuals must assume their responsibility alongside the community and political actors.

Related Concepts: POWER OF JUDGEMENT; HOMO OECOMICUS & HOMO POLITICUS; IGNORANCE; INDIVIDUAL, COMMUNITY & ENTIRETY; SUSTAINABILITY & JUSTICE; JOINT PRODUCTION

## 1. History

The use of the word responsibility is often ambiguous; it is a complex expression and the different meanings of it are often confused. It is, therefore useful to begin with a thorough analysis of this notion. “At a first glance, responsibility does not seem to be an ethical expression as such, but rather an indispensable precondition of all ethics (see Baumgärtner et al. 2006: Section 11.2.1). Only he who is capable of assuming responsibility for his own actions is praiseworthy or blameworthy in an ethical sense. In this context responsibility was conceptualised as early as in Aristotle’s *Nicomachean Ethics*. When Aristotle (2000, Book III, Ch. 1) differentiates between voluntary and involuntary actions and declares that ‘praise and blame are bestowed on that which is voluntary, whereas the involuntary requires pardon’, he is referring to the following circumstance: One is responsible just for that which one undertakes voluntarily. Insofar as responsibility is a precondition of all ethics, it is simultaneously a pre-ethical category and, thus, ethically neutral (cf. Section 3.1 below). Bearing responsibility for one’s actions as such is neither praiseworthy nor blameworthy” (Baumgärtner et al. 2006: 233). “In an elementary sense of the word, responsibility means primarily answerability – to give account to somebody for one’s own actions. One bears responsibility if one is prepared to render account of one’s deeds. And insofar as one is responsible for one’s actions one can be held accountable for them (Jonas 1979: 174). Legal responsibility implies that we are liable for the consequences of our deeds, and from a moral perspective, we may be praised or rebuked. In this sense, to be responsible means that we are legally and morally *compos mentis*, i.e. we are sane.

The concept of responsibility has always been explicitly or implicitly dealt with in political philosophy and philosophical ethics (e.g. Kant 1996b [1797]). But only in the twentieth century did responsibility become a ‘key category’ (Ritter et al. 2001: Column 569)” (Baumgärtner et al. 2006: 225).

Max Weber (1988 [1919]), who lived from 1864 – 1920, introduced in his ethics of responsibility a much-debated differentiation between ‘absolute ethics’ and ‘ethics of responsibility’, which we will discuss in detail in Section 2.3. Since the last quarter of the previous century, the concept of responsibility has attained much attention “and Hans Jonas (1903 – 1993), for example, has even viewed responsibility as an ethical principle in his seminal monograph *Das Prinzip Verantwortung* (‘The Imperative of Responsibility’, Jonas 1979). The special attention which the concept of responsibility currently receives is, in our opinion, related to the consideration of two principal characteristics of human action: (i) the freedom of human action, and (ii) man’s ability to unfold power to realise what

they wish and intend (Arendt 1958 and – with respect to power – Plessner 2003). In particular, Jonas' (1979) book was written in light of the environmental crisis. It lends expression to the fact that economic activity, in combination with the dramatically increased power of modern technology, has a significant influence on the natural environment" (Baumgärtner et al. 2006: 226).

We have shown in the concept JOINT PRODUCTION [see also IGNORANCE] that the consequences of production result in unintended joint products which have damaging effects on the environment, many of these effects are not foreseeable. This leads to fatal limits on our abilities to act responsibly. It even endangers our potential to assume responsibility. This problem of practical philosophy has received little attention in public and scientific discourse (see sections 2.2 and 2.3).

## 2. Theory

The concept of responsibility is explained in Section 2.1. We start to examine the term responsibility as in "to assume responsibility for something" by distinguishing two meanings. We argue that responsibility is crucially related to human beings' freedom and power to act. Section 2.2 discusses limits of responsibility. In particular, due to the complexity which joint production [JOINT PRODUCTION] introduces into the consequences of our actions, a problem of responsibility arises. In Section 2.3, we describe how responsibility can be not only a foundation of ethics, but an ethical principle in its own right, even a virtue. Section 2.4 summarises our findings in this chapter" (Baumgärtner et al. 2006: 225).

### 2.1 Two meanings of responsibility: ascription and moral obligation

The concept of responsibility gained momentum over the course of the twentieth century. Jonas' (1979) pioneering book, in particular, was an answer to the problems raised by the environmental crisis.

"Jonas' concept of responsibility directly implies the imperative that the natural environment, and therefore the foundation of human existence, be preserved. For, responsibility is the flip-side to freedom as well as to power.

There exists a close relationship between responsibility and freedom [HOMO OCONOMICUS & HOMO POLITICUS]. A person is only the perpetrator of an action if that action can be described as the realisation of that person's intention. Only a free actor can have intentions and realise them. Responsibility therefore presupposes freedom. On the other hand, only he who can realise intentions through his own actions and can assume responsibility for his actions is truly free. For, insofar as his actions bring about something he does not intend and is not responsible for, these actions do so against his will, i.e. are involuntary (Aristotle 2000, Book III). In this respect, he is not a free actor. Hence freedom demands the capability of being responsible. Corresponding considerations hold for power and responsibility. A person is responsible only for what 'is in his power'. In all situations in which one is powerless, one not only does not need to bear responsibility, but is, in fact, unable to do so" (Baumgärtner et al. 2006:226).

#### Primary meaning of responsibility: ascription

"To start with, responsibility means that one is the perpetrator of one's deeds. A person can determine his will freely; he is free to determine his aim of acting and to do something in order to realise this aim [INDIVIDUAL, COMMUNITY & ENTIRETY]. These actions are ascribed to him, and in this sense, he is responsible for these actions and their consequences. This is what we call the *primary meaning of responsibility*.

With this, the expression 'to assume responsibility' remains undefined. In the first instance, it only means that one ascribes an action to oneself and allows for it to be thus ascribed. So far, this does not address the consequences of responsibility, such as liability or any other obligations etc. We therefore conclude that responsibility in this primary meaning has, as such, no moral relevance. In Jonas' words, the primary meaning of responsibility 'is a precondition of morality, but not morality itself' (Jonas 1979: 179, our translation)" (Baumgärtner et al. 2006: 226f).

#### Secondary meaning of responsibility: moral obligation

"Alongside the primary meaning of responsibility, there exists a secondary meaning of the word. It builds on the first one and is of special significance in the fields of politics and, in particular, environmental politics. Whereas 'assuming responsibility' in the primary sense only means that an action and its consequences are ascribed to the perpetrator, in a stronger sense 'responsibility' means that legal and moral obligations arise for the perpetrator. The perpetrator is 'responsible' in the sense that his actions and their consequences meet certain legal and moral standards. We call this kind of responsibility the *secondary meaning of responsibility*. In its secondary meaning, responsibility imposes

moral or legal obligations. Consequently, one has to give account for their fulfilment or non-fulfilment.

Responsibility in the sense of ascription (primary meaning) is a precondition for assuming responsibility as a legal and moral obligation (secondary meaning). A person can only accept legal and moral obligations for those actions, and their consequences, of which he is the perpetrator, i.e. which are ascribed to him. However, moral meaning attains to the concept of responsibility only insofar as a person, as the perpetrators of his deeds, bears responsibility for his deeds in the stronger sense of the secondary meaning.

Based on the distinction between negative and positive obligations by Philippa Foot (1994), we distinguish between negative and positive responsibility:

Negative responsibility imposes the obligation that one's actions and their consequences do not damage another person or thing. Assuming responsibility in this sense means that one has to give account for the fulfilment or non-fulfilment of this requirement. Negative responsibility is limited in the sense that one is responsible only for one's deeds.

Positive responsibility means to assume responsibility for something in particular – e.g. for oneself, for another being, for a company, or for a specific field of action. As a consequence, one is positively responsible for the good state of being of this person, company, or field of action. A minister, for example, is responsible for a specific ministry or an area of affairs such as the finances of the state. Positively assuming responsibility for somebody or something implies that one is not only responsible for one's deeds but also for one's omissions. A minister, being positively responsible for the good state of being of his ministry, has to accept the responsibility also for the failure to take necessary action within the corresponding area of affairs.

Assuming positive responsibility means that the well-being – or even existence – of what is placed in one's charge depends, at least in part, on one's actions. In this sense, Jonas (1979: 391) defines responsibility as 'care, accepted as an obligation, for another being – care which, should the vulnerability of its charge be threatened, can become concern' (our translation). Hence, to be responsible for something in particular means that one is obliged in a legal or moral sense to care for its well-being. In order to fulfil this obligation one needs the capability to act; in particular one needs the power to do so. Thus, this meaning of responsibility accentuates the fact that those bearing responsibility must also be endowed with power to do what they wish and intend.

Generally, in the secondary meaning of the word, one bears responsibility in a legal or moral sense for compliance with certain rules or principles. One always bears this responsibility *to someone* or *some authority*. For example, an employee is responsible to

his superior, a citizen is responsible before the law, the government is responsible to the parliament” (Baumgärtner et al. 2006: 227f).

### Summarising

“Summarising, human beings are responsible for their actions and the consequences thereof. In a moral sense, they bear responsibility for something in particular or somebody. Responsibility in the secondary meaning imposes legal or moral obligations on them, the fulfilment of which they have to give account for. Concerning environmental policy, a fundamental question arises from this: Can one accept responsibility for the production of wanted goods despite the accompanying joint products?” (Baumgärtner et al. 2006: 228). We shall turn to this question in the next section.

“Primary meaning: Responsibility for the consequences of one’s own

- action, in the sense of ascription.
- This is a precondition for morality, not morality itself.

Secondary meaning: Responsibility for the consequences of one’s own

- action or for something in particular, in the sense that moral and legal standards have to be met.
- This imposes moral or legal obligations.

*Negative responsibility:* Actions must not damage another subject.

*Positive responsibility:* Responsibility for the good state of being of

- something in particular, e.g. an object, an
- individual, a group or an institution” (Baumgärtner et al. 2006: 229).

## 2.2 Responsibility and joint production

### Limits of responsibility

“As has been mentioned, responsibility is the flip-side to a human being’s freedom to act. Someone is only the author and master of his actions insofar as he can assume responsibility for these actions and their consequences. That for which someone assumes responsibility can be ascribed to him. To this extent he is *compos mentis*, i.e. he is sane. He who cannot assume responsibility for what he does is not sane. Thus, only he who can

assume responsibility is actually capable of taking concrete action. This raises the question of the extent of one's responsibility.

An action as the origin of effects or consequences is a complex matter. Every action has a variety of consequences which are not entirely discernible. Among those, human beings generally single out only one consequence as the objective of the action, thus elevating it above the others. Setting an objective is always a reduction of complexity – often the action is identified with its objective. Concerning the objective of an action, one speaks of the goal justifying the action. However, the means chosen have to be appropriate to the respective ends. What is appropriate is not an arbitrary affair, but always depends on a specific point of view – in general, that of the moral community as a whole. For example, if one cuts the main electrical cable of a house, one cannot call this 'switching off the radio', even if this action does lead to the radio being switched off. One can say: As long as it is generally accepted that the means are appropriate to the end, the action makes sense. Conversely, it makes no sense to call cutting the main electrical cable 'switching off the radio'" (Baumgärtner et al. 2006: 229f).

#### Joint production: a broader range of side-consequences

"Along with the intended outcome, there exist further consequences. These unintended consequences we shall call side-consequences or concomitants. Many concomitants emerge as the material or energetic joint products of production activities [JOINT PRODUCTION]. The general principle of joint production (see Baumgärtner et al 2006, Section 4.4.3), however, points to the existence of a broader range of side-consequences. The perpetrator of an action does not intend such concomitants but, as far as he foresees them [IGNORANCE], he accepts or condones them. The range of concomitants, which an individual 'foresees' in this manner, is not entirely up to him. He must assume responsibility not only for the consequences he actually foresaw, but also for all those which he could, or should, have foreseen. Responsibility refers not only to the action itself, but to the prescience of consequences, at least insofar as such prescience is feasible at all.

These reflections indicate that an individual's responsibility has limits, for one can generally foresee only a part of the consequences of one's own actions. It is, for instance, impossible to foresee chance consequences of an action. These are consequences which an action does not lead to by necessity, but which arise from further circumstances that can be given or not. In other words, chance consequences are contingent consequences. An example of such chance consequences – entailing severely limited prescience – are the possible reactions of other human beings to one's own actions. An individual cannot be held liable for unforeseeable consequences. He need not assume responsibility for them.

Furthermore, such consequences do not belong to the purpose of the action. Hence, responsibility for the consequences of an action always has limits” (Baumgärtner et al. 2006: 230).

### Brief summary

“Responsibility for foreseeable consequences.

No responsibility for unforeseeable consequences, e.g. chance consequences” (Baumgärtner et al. 2006: 230).

### Complexity and responsibility

“A severe problem for assuming responsibility arises in cases in which one can no longer see the extent of the circumstances of one’s action – that is, when the range of emerging concomitants displays high complexity [EVOLUTION; POWER OF JUDGEMENT]. Due to such complexity, an individual is often unable to foresee certain crucial conditions for achieving his goals [IGNORANCE]. This jeopardises the individual’s possibility of taking responsibility for his action and, thus, his freedom (primary meaning of responsibility, as defined above). Thereby, it also impairs his capacity to assume negative or positive responsibility for something or somebody (secondary meaning of responsibility). There are two aspects: (1) In the political discourse, many people demand that the ‘self-responsibility’ or autonomy of the individual should be bolstered [HOMO OECOMICUS & HOMO POLITICUS]. Self-responsibility or autonomy means: ‘I can take care of myself for my life, and I can support myself, particularly in my old age’. Such self-responsibility is becoming increasingly difficult in the modern world. For instance, hardly anyone can make sufficient provision for their old age nowadays without outside expertise. (2) A second important aspect of complexity is the inherent possibility that one’s actions are not dictated by one’s own intentions, but by ‘systematic regularities’. These arise from the intricacy of the concomitants of an action. The meaning of the action is thus defined by such regularities, not by the intentions of the enactor. In such cases, a concomitant of the action – that is to say, a concomitant from the point of view of the enactor – may become the defining aspect from an external perspective.

Such a perspective is common to social science. Examples may also be found in economics: According to Adam Smith (the founder of Mainstream Economics; 1723-1795), selfishness in market economies actually contributes to something which can by no means be called its original intention, namely, general wealth and well-being. Political economics provides further examples, such as the bureaucrat who has the public good in mind yet



only manages to contribute to the inefficient expansion of his administration [Downs 1967; HOMO OECONOMICUS & HOMO POLITICUS]. In these cases, the individual is no longer master of his actions; one could say he is unfree.

We can conclude that the complexity of our actions and their – intended and unintended – consequences places severe limits on our abilities and capabilities. In particular, it tends to jeopardise our potential to assume responsibility. This problem has long been recognised in practical philosophy (Spaemann 1989: 186-202) but, thus far, has only been conceptualised and discussed with regard to social interaction” (Baumgärtner et al. 2006: 230f).

### A different perspective for the relationship between humankind and nature

“Concerning the relationship between humankind and nature, a quite different perspective seems to prevail. In modern times, nature has been viewed as being principally under man’s stewardship and control: That man would ‘rule nature in practice’ was once the hope expressed by Francis Bacon (1561 – 1626) (quoted after Horkheimer and Adorno 1968: 14; see Faber and Manstetten 2010: 68-71). Man bends nature to his service by shaping her according to his will, generating something out of her – in what is called ‘production’ [INDIVIDUAL, COMMUNITY & ENTIRETY]. Now we recognise, however, that man’s control of nature is limited. The ubiquitous phenomenon of joint production reminds us that we cannot produce something without simultaneously producing something else, which often was originally not intended [IGNORANCE; EVOLUTION].

One can map the structure of joint production and the problem of responsibility onto each other. In Baumgärtner et al. (2006, Section 2.4), we have defined joint production relative to a system representation and a time horizon [BASICS OF TIME] which are both chosen by the observer. With respect to a thermodynamic system representation [THERMODYNAMICS] – that is, in a complete ‘image’ of all nature – it was shown in Baumgärtner et al. [2006: Chapter 3; see also JOINT PRODUCTION] that all (industrial) production is joint production.

Representations used in a typical analysis will, however, abstract from many outputs, in particular from environmentally damaging ones. Hence, in such representations it is an a priori open question whether or not the production of an output A necessarily brings forward joint products. Although the category of intent is disregarded in this conceptualisation of joint production, one can still map the concept of joint production to the problem of responsibility. Consider a system with  $n$  outputs, such that in a thermodynamic representation output A is the main product and outputs  $B_1, \dots, B_{n-1}$  are joint products of A. However, in a different, ‘incomplete’ representation, the production of A may bring forward only the joint products  $B_1, \dots, B_m$  with  $m < n - 1$ . We can express this situation in

terms of responsibility for the consequences of one's action. Let the action 'production' have an intention  $Z$  (production of output  $A$ ) and the concomitants  $Y_1, \dots, Y_s$  (stemming from the joint products  $B_1, \dots, B_{n-1}$ ), whereby the enactor must assume responsibility for  $Y_1, \dots, Y_k$  (stemming from the joint products  $B_1, \dots, B_m$ ) with  $k < s$ . We can say: The enactor of the action is assigned responsibility on the basis of a certain representation of the system, whereby the choice of the representation is not up to him.

The concept of joint production illustrates the fact that the economy in its 'material reactions between [man] and nature' (Marx 1902: 156) displays an equally unfathomable complexity as the sphere of social interaction. This holds for all cases in which one takes complex environmental issues into account. Let us consider the example of a newly produced vehicle. Before this vehicle one day becomes waste, it gives rise, at every use, to joint outputs and environmental effects in the form of waste from replaced parts and exhaust emissions which accumulate in the environment and themselves bring forth further joint effects.

Whereas moral philosophy has discussed complexity in politics only with regard to social interactions, the concept of joint production makes it possible to extend such a discussion to the interaction of human action with nature [HOMO OEOCONOMICUS & HOMO POLITICUS; TELEOLOGICAL CONCEPT OF NATURE]" (Baumgärtner et al. 2006: 231f).

Before turning to this issue, we raise yet another important aspect of responsibility because we are confronted with a central human dilemma of not knowing the consequences of our actions [IGNORANCE].

### 2.3 Conditions of complexity and joint production: responsibility as a virtue

"The complexity of the consequences of one's actions, e.g. the complexity emerging from joint production, which can hardly be completely grasped [IGNORANCE], confronts us as human beings with a dilemma: how are we to act in a good manner under such circumstances? In light of such complexity, the philosopher Hans Jonas (1979) speaks of an 'imperative of responsibility' which – according to Jonas – must form the basis of all ethics.

Such an imperative has been rejected, e.g. by Wieland (1999) who reasons that responsibility is not an autonomous ethical principle and thus cannot be a 'definitive norm'. Wieland's critique is directed at the particular 'ethics of responsibility' which seeks to justify actions by their consequences. Of course, such a justification is impossible where the

consequences of an action cannot be entirely monitored [POWER OF JUDGEMENT]” (Baumgärtner et al. 2006: 233).

#### An ethics of responsibility is not possible

“Hence, such an ethics of responsibility is not possible with respect to economic activity, if only for the reason that the consequences of, e.g., an act of production can never be entirely monitored under conditions of joint production [JOINT PRODUCTION]. Although responsibility cannot be the sole principle [POWER OF JUDGEMENT], we shall demonstrate that it is yet one principle of ethics and can even be conceived as an independent virtue” (Baumgärtner et. al 2006: 233).

#### Max Weber’s conflict between ‘absolute ethics’ and ‘ethics of responsibility’

“However, these moral obligations can come into conflict with other moral obligations. Situations may arise in which, in order to save the life of another person, one must resort to a lie or to breaking the law. The recognition of this conflict led Max Weber (1988 [1919]) to contrast ‘absolute ethics’ with ‘ethics of responsibility’. Such ethics of responsibility were not simply to justify lying or breaking the law, but to preserve one from being unqualifiedly damned from the point of view of absolute ethics.

Weber’s concept of ethics of responsibility remained extremely abstract, however. It implied only that one had to ‘answer for the (foreseeable) consequences of one’s actions’ (Weber 1988[1919]: 522; our translation). Weber, however, has never specified in concrete terms what this means. He also did not address the questions regarding how one is to choose in an ethical conflict, which consequences of one’s actions one must assume responsibility for, or to whom or which authority one bears such responsibility.

So, what exactly do Weber’s ethics of responsibility stipulate? A person who is taking his responsibility seriously confesses to his actions and their consequences. He also is willing to answer, or even be held liable, for them. Ethics of responsibility, therefore, lay down a simple imperative: you shall not deny yourself as a free individual” (Baumgärtner et al. 2006: 234).

#### Kant’s notion of good will

“What the fulfilment of this imperative requires, is simply ‘good will’ in the sense of Kant (1996a [1785]) [SUSTAINABILITY & JUSTICE, Sections 2.4 and 3.5] which everyone can possess at any time. This demand is simple, but by no means trivial. The difficulty of assuming responsibility in this manner is demonstrated by the many individuals in politics

and economics who are not prepared to answer or accept responsibility for their decisions, but instead hide behind ‘circumstances’ and ‘compulsions’. Willingness to answer for one’s actions and to assume responsibility for them, is, particularly in political ethics, an imperative directed at those involved in politics. Nevertheless, it is easy to assume responsibility in the sense of Weber. It requires nothing but the willingness to answer for all, possibly unpleasant, consequences of one’s actions. For example, a minister, in whose ministry a serious error has occurred, resigns. Such a reaction does not require any specific capabilities other than good will” (Baumgärtner et al. 2006: 234f).

### Responsibility as a virtue

“On the other hand, European ethics know another form of imperative which requires special talents that must be acquired and rehearsed – namely ‘virtue’, as Aristotle (2000) called it. In what follows, we argue that responsibility under the conditions of joint production is such a virtue [POWER OF JUDGEMENT]. According to Aristotle, virtues (e.g. justice, temperance and courage) enable one to act in a good and correct manner in one’s day-to-day living, and thus to live the ‘good life’ (Aristotle 2000: Book II, Chapter 1). Virtues require more than simply strength of will, however.

Virtues always require practice and habituation (Aristotle 2000: Book II, Chapter 1), as well as an objective and ethically adequate evaluation of the specific situation and one’s own possibilities. The ability to make such judgements must be carefully developed and cultivated. According to Aristotle, the most significant point is that every situation is unique in its particular complexity and that it is therefore impossible to formulate a general rule as to how to act or conduct oneself (Aristotle 2000: Book II, Chapter 2, 1104 a 3–6): ‘Matters concerned with conduct and questions of what is good for us have no fixity.’ According to Aristotle, action always occurs under conditions of uncertainty, and virtue is to enable people to act correctly under such uncertainty.

This brings us to the very point at which responsibility under the conditions of joint production requires the capabilities Aristotle calls for. The phenomenon of joint production confronts us with two separate types of uncertainty:

- (1) We know that our actions give rise to unintended joint products or – more general – side-consequences. But we do not know whether we are observing all of these or not.
- (2) Furthermore, we do not know what significance such identified or unidentified joint products or side-consequences have. The occurrence of joint production often gives rise to an inscrutable complexity, similar to that which Aristotle had in mind. Under these uncertainties, if someone is to be responsible for someone or something in the secondary

meaning, then this person must be able to answer questions such as the following: Which ethical and normative principles must my actions fulfil? What does the preservation and well-being of that, which I am responsible for, require? Which risks and dangers do my actions entail? Which risks may I accept? What degree of ignorance can I safely tolerate? There exist no universally valid answers to these questions [POWER OF JUDGEMENT]” (Baumgärtner et al. 2006: 235f).

#### A certain form of experience and ethical wisdom: *phronesis*

“In order to answer the questions, one requires a certain form of experience and ethical wisdom which Aristotle calls *phronesis* (φρονησις) (Aristotle 2000: Book VI, Chapters 5, 8 and 9). *Phronesis* is the capability of judgement which can associate ethical edicts with the concrete necessities of any given situation. *Phronesis* deals with both normative and factual aspects and must relate them to one another in a meaningful manner. All this requires knowledge, not least of one’s own inevitable ignorance.

For Aristotle, *phronesis* – or ethical wisdom – is the heart and soul of any virtue. He who is not wise in this manner cannot be virtuous (Aristotle 2000: Book VI, Chapter 5, see also Book II, Chapter 6, 1106b 36ff). As we have argued, one can only assume responsibility for someone or something insofar as one possesses such wisdom. Thus, responsibility, in the sense of assuming responsibility for someone or something can be viewed as a virtue in Aristotle’s sense of the word” (Baumgärtner et al. 2006: 236).

## 2.4 Summary hitherto

“In this chapter so far, we have examined the term ‘responsibility’ in order to place it in a shared context with the phenomenon of joint production. The complexity induced by joint production in nature gives rise to similar difficulties as they are observed in the complexity of social interactions. The problem of acting right, given that consequences are myriad and, hence, impossible to keep track of, leads to an understanding of responsibility as a virtue.

There seems to be a difference, however, between human interventions into nature and human behaviour in the social sphere [TELEOLOGICAL CONCEPT OF NATURE; HOMO OECOMICUS & HOMO POLITICUS]. Joint products and their effects arise by necessity from the process of production, whereas such strict causality does not exist in the field of social behaviour. With respect to the latter, it was already observed by Aristotle (2000: 107; 1140 b 1) that ‘such thing might be otherwise’ in other words, that they are contingent. In acting

there exists an element of unpredictability, namely novelty. For this reason, taking action was not an object of science for Aristotle, but an object of practical wisdom (phronesis). With regard to joint production, things ‘can be otherwise’ (Aristotle 2000: 107; 1140 a 22/23) as well, namely whenever one views joint production, not as a natural, but as an economic phenomenon” (Baumgärtner et al 2006: 236). This is discussed in detail in the concept IGNORANCE.

## 2.5 Individual and collective responsibility

In the first four sections of this chapter, “we have investigated the term ‘responsibility’ and have placed it in one context with the phenomenon of joint production. Thereby, it became clear that responsibility is not only a precondition of ethics – at least insofar as one is free in actions of ethical relevance only if one is responsible for these actions – but that it is, furthermore, an ethical principal in its own right and can even be regarded as a virtue in the sense of Aristotle.

Responsibility is a virtue because the complexity of the consequences of any individual action makes it generally impossible to entirely foresee those consequences. Thus, an individual can become a hostage of his own actions insofar as he is not aware of what he is doing. Above all else, responsibility as a virtue comprehends the right handling of the ignorance which is inevitably inherent to all action. Such ignorance is a particularly serious problem wherever one encounters joint production” (Baumgärtner et al. 2006: 253).

“At this point, a number of questions remain to be addressed. We have already intimated that responsibility is by necessity limited in certain ways. According to Hegel (1770 – 1831) (1970) [1821], one only bears responsibility for the necessary consequences of one’s actions” (Baumgärtner et al. 2006: 253). “We demonstrated, however, in the concept IGNORANCE ‘that this limitation becomes inadequate under the conditions of joint production. If such a limitation is not possible in a general manner, then one must ask whether specific types of responsibility exist – types, some of which are more strictly limited and others less so. At the same time, it remains to be clarified for each type of responsibility who bears it and to whom. In the following, we differentiate between four types of responsibility: legal and moral (Section 2.6), political (and political-ethical responsibility (Section 2.7). It will become clear that political-ethical responsibility is the most comprehensive.

Each of these types of responsibility will be considered under the aspects, for what (or for whom), to whom (or toward which authority), and in regard to what (or according to which

measure) responsibility must be assumed. We shall begin with the sphere of law, as this is the area in which responsibility can be most clearly defined” (Baumgärtner et al. 2006: 253f).

## 2.6 Individual responsibility: legal and moral

### Legal responsibility

“Legal responsibility means that the consequences of one’s actions rebound on the perpetrator. In other words, they are certain forms of feedback on the basis of which one is ‘called to account for the consequences of one’s deeds’ (Wieland 1999: 26, our translation). Sanctions of the legal system ‘guarantee that certain consequences of his deeds rebound onto the enactor’ (Wieland 1999: 26). Such feedback consists of either sanctions for violations of legal rulings or liability for damage which one’s actions cause to others. Such liability can refer to occurrences which are, at best, indirectly associated with one’s own actions.

Thus, parents are liable for the actions of their children, and the owners of an automobile for damage caused by that automobile, even if it is not directly their fault – for example, if it should catch fire and cause a major accident. An individual bears responsibility, in a legal sense, toward whichever authority passes laws and enforces them. The measure of his responsibility is the legal system. Under such a legal system, it is possible to precisely define and delineate responsibility so that, in general, an individual can be relatively certain of what to expect” (Baumgärtner et al. 2006: 254).

### Moral responsibility

“The emphasis of moral responsibility does not primarily lie on the consequences of one’s actions, but on the actions themselves. He who acts freely is responsible for his actions. Should these actions be good, then he acts responsibly – as long as his actions are compatible with serious ethical principles. Otherwise, his actions are bad and subject to reproach.

Should his ethics be an ethics of virtue, then he must assume responsibility not only for his actions, but also for his attitudes and habits. He has to be prepared to justify them with respect to his ethical principles. These principles constitute the measure according to which he bears responsibility. In contrast, the authority toward which he bears such responsibility can be defined in different ways: One can bear responsibility [INDIVIDUAL,

COMMUNITY & ENTIRETY]: Toward oneself, toward 'one's own humanity', or toward moral society as a whole" (Baumgärtner et al. 2006: 254f).

### The difference between legal and moral responsibility

"Moral responsibility differs from legal responsibility in that the purpose of the action or the individual's intention plays a central role. An action is not judged on the basis of its actual consequences; but the judgement depends on the intention and the seriousness the action is executed with. This holds even for utilitarianism since, although utilitarian ethics is based on the action's consequences, utilitarians must judge the respective action according to the intended consequences (cf. Tugendhat 1993: 109). However, the emphasis of moral responsibility on the 'correct' intention does not mean that the consequences of an action can be entirely neglected. The correct intention includes taking the consequences into account, thus no action can be labelled 'good' from which only negative consequences can be expected with certainty, or at least with high probability. There exist, as far as we can see, only two exceptions to this rule: (1) The evil is justified by a higher ethical principle, e.g. in the manner in which punishment is justified by justice, or (2) the evil is balanced or compensated by a higher good so that one can justify accepting or condoning it.

Moral responsibility shares with legal responsibility the characteristic that, as a form of responsibility for the consequences of one's actions, it is a limited form of responsibility. While law itself draws the limits for legal responsibility, Hegel's (1970) [1821] differentiation between necessary and chance consequences finds its place in moral responsibility: as a rule, a person must assume responsibility only for that which follows by necessity from his actions and which he can anticipate. In this sense, Kant (1724 – 1804) (1996b [1797]: 612) also declares: Should someone act correctly, then he needs bear no responsibility for that which follows from his actions by chance. Chance consequences, for example, can be actions and deeds stemming from the will of another person. A person is not responsible for deeds of other persons, even if such deeds only become possible due to the person's own just acting in the first place.

Legal and moral responsibility, therefore, generally only refer to the individual. They focus on the consequences of the individual's action), and such responsibility is always limited as we have discussed above (see Section 2.2). In the legal case, responsibility is explicitly limited by law itself, whereas in the case of moral responsibility, responsibility is limited by the occurrence of chance consequences. However, an unambiguous differentiation between the necessary and the chance consequences of an action may be impossible to make [IGNORANCE]. Also, a temporal limitation of responsibility can exist. In legal terms, this takes the form of the statute of limitations: One cannot be held liable – or, in other words,



legally responsible – for consequences of actions which only appear or become enforced after a certain time period has elapsed” (Baumgärtner et al. 255f).

## 2.7 Collective responsibility: political and political-ethical

“Political and political-ethical responsibility differ from the individual responsibility of the legal and moral kinds. Responsibility in the political and political-ethical sense does not primarily refer to responsibility for the consequences of an action, but rather to a form of responsibility for the state of being of something in particular – for example for the preservation and well-being of a political community [SUSTAINABILITY & JUSTICE]. Being responsible for a state of being renders irrelevant the limits which apply to the responsibility for an action and its consequences. Responsibility in the political and political-ethical sense must be assumed for all foreseeable consequences which could be significant for the state of being of that which is placed under one’s responsibility. Moreover, the subject who must assume responsibility is not necessarily a single individual. Instead, the subject often is a collective, a community [INDIVIDUAL, COMMUNITY & ENTIRETY] – or perhaps an individual who regards himself as a member of the community and is acting on its behalf” (Baumgärtner et al. 2006: 256).

### Political responsibility

“Political responsibility is borne by all who take part in political activity. Political activity is the realisation of the interests of a political community, for example a state. We credit political activity with the capability of preserving such a community and, at the same time, shaping the world around us. Political activity is also the application and realisation of power. Insofar as power is ascribed to an individual in a political sense, he is burdened with responsibility for the consequences of all he does.

Such political responsibility appears to be unlimited insofar as the one who bears it is furnished with power to guide the fate of the political community. Concerning this fate, the differentiation between necessary and chance consequences is irrelevant: The political subject has to assume responsibility with regard to necessary and chance consequences of his political acting [IGNORANCE]. For example, a government is always held responsible for the state of the economy, even if that state is only partly – and that can mean by chance – a consequence of the government’s own doing. Phases of prosperity are equally accredited to the government as are recessions. A politician who wishes to live up to his calling must therefore have good fortune.

Furthermore, political responsibility appears to be temporally unlimited. Whether a politician has successfully reformed a political community or has effected its long-term collapse, can only become discernible after several generations. How this case is evaluated, however, usually determines one's view of that politician" (Baumgärtner et al. 2006: 256f).

### Political-ethical responsibility

"Political responsibility is derived from the experience that those involved in the political process have, and exert, power. They are measured by the application of such power and by the realisation of the goals which are normally ascribed to them: in other words, by their success. Above all else, one assumes that the goal of such a political actor is the preservation, the ascendancy and the well-being of the political community.

The conceptual content of political responsibility is, however, one-sided insofar as it is orientated solely toward success but never asks about the means with which such success is achieved. One can, however, demand of political activity itself that it applies moral standards also to the means employed to achieve success (see Section 2.3 above).

If we wish to evaluate political responsibility along such lines, then we arrive at the notion of a 'totality of responsibility' as Jonas (1979: 189) termed it. Responsibilities have totality insofar as they 'encompass the total state of being of their objects, that is to say every aspect of it, from their naked existence to their highest interests' (Jonas 1979: 189). We label this form of responsibility political-ethical responsibility and relate it not only to the preservation and prosperity of the community – in other words to the common good – but also to the notion of justice [SUSTAINABILITY & JUSTICE]. Justice, which belongs to the 'highest interests' of the community, includes at least the democratic principle, the rule of law, the guarantee of human rights, and the preservation of the possibility to act politically.

As political-ethical responsibility draws on the standards of the common good and justice, it is truly the most comprehensive of all the categories of responsibility we have dealt with. The comprehensiveness of political-ethical responsibility raises the possibility that stipulations of the common good and of justice might come in conflict with one another – a conflict which may be irreconcilable and unsolvable. A war, for example, however legitimate and necessary it may be, always entails innocent victims. Such conflicts are of a tragic nature and, in the sense of Max Weber's ethics of responsibility (see Section 2.3 above), it becomes clear that the tragic nature of certain conflicts require our special attention. The concept of ethics of responsibility emphasises the fact that in politics it is impossible to guarantee the moral integrity of actions by strictly limiting responsibility for the consequences of an action, as Kant and Hegel (see Chapter 1 and Section 2.3, 2.5

and 2.6) propose it for moral activity. In particular, someone involved in politics can never absolve himself of responsibility for the reaction of his counterpart to his own deeds.

The comprehensive, total character of political-ethical responsibility emphasises another difficulty which the complexity of the consequences of an action entails. The power that someone involved in politics ascribes to himself allows him to disregard none of the concomitants of his actions. To a certain extent ‘the difference between purpose, intent, action, main and side consequence is irrelevant’ (Spaemann 1977: 180, our translation) to someone involved in politics. ‘And wherever negative consequences arise from his actions, then their elimination is in turn also his task’ (Spaemann 1977). In this manner, however, this person runs the risk of becoming entangled in the consequences of his actions so that in politics ‘side effects of actions are processed rather than decisions made’ (Meier 1983: 20, our translation). As a result, he who lays claim to power is doomed to be powerless – he is no longer the master of his actions.

This danger appears to be particularly relevant under conditions of joint production, for the consequences which arise from joint production are irreversible [IRREVERSIBILITY] in the majority of cases. The situation becomes additionally complicated by the fact that ignorance exists with regard to the possible joint products themselves, their consequences and their desirability in the future. Hence, there is a danger that a person who has to assume political-ethical responsibility becomes a prisoner of the joint products and side effects of his action: He may be completely absorbed by the elimination of undesired joint products and the neutralisation of undesired effects. He would no longer be acting, only reacting.

An example of this danger is generating electricity from nuclear energy. Radioactive materials are produced which must be stored or disposed of over generations, thus placing long-term obligations on politicians. The dangers of these radioactive joint products, and the extent of the measures which must be taken to deal with them, can hardly be ignored. The use of nuclear energy thus endangers the good of a political society, as well as its ability to act – in other words, its ability to assume responsibility for its own actions.

Nuclear reactors can also become the objective of terrorist attacks, which would have terrible consequences. This example helps clarify the difference between moral and political-ethical responsibility. In Hegel’s sense, a terrorist attack on a nuclear reactor is a chance consequence of a political decision in favour of nuclear energy. As the attack is a deed brought about by an evil will, the politician in question need not assume responsibility for such an attack nor its consequences – in the moral sense of the term explicated above (see Section 2.2 above). However, in the political-ethical sense this, precisely, does not hold. It is not solely the terrorist himself who is responsible for the consequences of the

attack, but equally those who assumed responsibility for the political decision in favour of the use of nuclear energy” (Baumgärtner et al 2006: 257-259).

Finally, we note that we have yet not dealt with the precautionary principle. We shall postpone this discussion to the concept Ignorance since the concept of ignorance is a precondition for a thorough analysis of the precautionary principle.

### Conclusion

“We summarise the four categories of individual and collective responsibility discussed in this chapter.

#### Individual responsibility

- legal responsibility; limited by law
- moral responsibility; limited by ethical principles

#### Collective responsibility

- Political responsibility for the common good
- Political-ethical responsibility: common good and justice

At this point, we are left with a major problem of responsibility as imposing moral obligations (secondary meaning, see Section 2.1) with regard to joint production: How do and how should individual economic agents and the political community deal with unintended joint products which fall outside the social and legal order? We will address this question in the following chapter” (Baumgärtner et al. 2006: 259).

### 3. Practice: the homo politicus, economic agents and perspectives for environmental politics under the conditions of joint production

We now turn to the political consequences of our deliberations on responsibility in view of environmental matters. “In the previous chapter, we differentiated four types of responsibility. We pointed out that political-ethical responsibility is the most comprehensive one. This kind of responsibility is therefore potentially the most relevant one for giving guidance when facing unintended joint products which fall outside the social and legal order. The question thus arises as to who bears this kind of responsibility and what the necessary attributes of someone are to be able to do so. It is obvious that the standard

conception of an individual as an economic agent (*homo oeconomicus*) is not suitable to systematically characterise such a person [Three Interests]. In this chapter, we shall argue that an individual who is to bear responsibility can, in particular, be conceptualised on the basis of the *homo politicus* hypothesis (Section 3.1). To *homo politicus*, responsibility is to be ascribed as a virtue [HOMO OECONOMICUS & HOMO POLITICUS]. On the basis of this argument, we can then outline perspectives for environmental politics under the conditions of joint production. In doing so, special significance falls on the relationship between the responsibility of the economic agent and that of the politician (Section 3.2). Two conclusions and a summary are given Section 3.3” (Baumgärtner et al. 2006: 261).

### 3.1 Collective responsibility: political-ethical responsibility and the *homo politicus*

“Political-ethical responsibility, being the most comprehensive form of responsibility, places the highest demands on somebody to bear this kind of responsibility. Yet how can we conceptualise such a political individual who is capable of living up to political-ethical responsibility? In earlier work, we have argued that the political individual is to be conceived of as a *homo politicus* (Faber et al. 1997, 2002, Petersen and Faber 2000).

The *homo politicus* never acts only in his own interest. Rather, he views himself as a part of the community. He always acts for the community; what he undertakes out of his own initiative is always orientated toward common activity and common decision-making. As a *homo politicus*, an individual involved in politics always orientates himself toward the demands of the common good and justice. At the same time, he is characterised by the capabilities necessary to successfully pursue these goals. We have therefore described the *homo politicus* as someone possessing certain virtues. In doing so, we regard virtue as a capability, as a sort of virtuosity in the sense of Aristotle: justice, courage, temperance, as well as practical wisdom (*phronesis*) [POWER OF JUDGEMENT; Faber et al. 1997: 471]. We can now ascribe a fifth virtue to the *homo politicus*, namely that of responsibility in the sense in which we have developed it in Section 2.3 above” (Baumgärtner et al. 2006: 261f).

#### The virtue of responsibility

“Against the background of political-ethical responsibility, the virtue of responsibility can be thought of as the ability to decide which actions one can assume responsibility for. That is to say, the *homo politicus* must be able to live up to the stipulations of justice and the common good [SUSTAINABILITY & JUSTICE], while at the same time retaining the possibility

of acting politically. He therefore is also responsible for conserving his ability to assume political responsibility.

Thus, the homo politicus must, on the one hand, strive to avoid the danger of becoming enmeshed in dealing with the concomitants of his actions and, hence, ceasing to be the master of his actions. On the other hand, he must take care that his actions do not endanger the common good or violate justice. Political activity, be it of a political community or the homo politicus, is always a powerful activity since it intervenes in the world, changing and shaping it. For the very reason that homo politicus as the bearer of political-ethical responsibility cannot limit his responsibility (cf. Sections 2.2 and 2.3), he must limit his own actions, namely the exercising of political power. He must limit it under the provisions of his responsibility in the abstract sense, namely to those actions which he can assume responsibility for. Regarding environmental politics, this means: Activity which changes the environment or nature must also be limited. And in this case, it is not only political activity itself which must be limited, but, in an appropriate manner, the activity of economic participants – who, after all, particularly intervene in the environment and nature.

#### How can the homo politicus live up to his responsibility in the face of ignorance?

So, how can the homo politicus live up to his responsibility? He is subject to the conditions of irreducible ignorance. Irreducible ignorance exists not only concerning social affairs, in other words, concerning the relationships between people, but also in the sphere of the relationship between man and nature [TELEOLOGICAL CONCEPT OF NATURE]. This became apparent from the discussion of joint production. We explained that under the conditions of irreducible ignorance there are no concrete, universally valid rules for how to act. In order to decide what one can assume responsibility for, one requires practical wisdom (*phronesis*). For this reason, we have defined responsibility as a virtue.

In the field of environmental politics, however, this virtue must meet special requirements. Environmental politics cannot do without scientific expertise: the politician is dependent on science, without this lessening his own responsibility. Environmental politics 'must strive to achieve the highest possible level of information with regard to the consequences of its measures' (Spaemann 1977: 180, our translation). Yet, as exemplified by joint production, science cannot eliminate ignorance with regard to the environmental effects of political decisions, but only hope to reduce it to some extent. Thus, political activity in the field of environmental politics requires a specific form of practical wisdom with regard to scientific findings [POWER OF JUDGEMENT].

From a person involved in politics we must, therefore, expect a certain level of scientific proficiency. He need not be a scientist himself, but he must be able to understand how

scientific findings or recommendations come about. On the other hand, one must also demand of scientists that they assume political responsibility to a certain extent. Science shares responsibility for informing society about the environmental effects of measures taken (Zahrnt and Zahrnt 2016); and about the limits of its expertise – about that which it does know, that which it can know, and that which it cannot know” (Baumgärtner et al. 2006: 262-263).

### 3.2 Individual responsibility: economic agents

“The question of individual and collective responsibility under the conditions of joint production would not be adequately examined if we did not ultimately turn our eye to the specific responsibility of the economic agent, for it is actually far less the activity of politics than that of the economic agent, be he or she producer or consumer, which intervenes in nature and gives rise to joint products with all their consequences. The individual economic agent, however, is – in his role as economic agent – systematically not capable of monitoring all of the consequences of his actions – be they necessary or chance consequences [IGNORANCE]. In order to be able to take part in economic activity in the first place, the agent must be able to see the relevant consequences of his economic actions, that is, those consequences for which he may have to account or be made liable. The responsibility for the consequences of his actions must be limited if he is to calculate them according to cost-benefit considerations, which is essential for economic activity.

#### The economic agent cannot assume responsibility for all consequences of his actions

Hence, the economic agent, if he is to be economically successful, cannot assume responsibility for all the relevant consequences of his actions. He cannot entirely foresee them and also would be completely overburdened with their neutralisation. He can therefore not be held accountable for some of the most significant consequences of his actions, in particular, in terms of environmental impact. If we take into account the intimate connection between responsibility and freedom explicated in Chapter 2 above, it follows that under the conditions of joint production; the economic agent is free in a limited sense only. The responsibility which he cannot assume himself must be assumed for him by politics. It is politics which must also decide on the limits of the individual agents’ responsibility and the corresponding consequences. The limited responsibility of the economic agent is therefore assigned politically. To define this responsibility, we want to relate to the representation of a *system* as the object of a – scientific or other – investigation (see Baumgärtner et al. 2006: Section 2.3.2). Such a system representation takes only a

certain portion of all joint products and consequences into account. Regarding the politically assigned responsibility of the economic agent, this means that the agent is assigned a specific system representation according to which he must consider and assume responsibility for joint products and their consequences in his production, consumption, or waste disposal activity.

#### Politics has to create a legal framework

How can politics assign a particular system representation to economic agents so that they can act responsibly within this limited framework? This is typically done by creating a legal framework which specifies in detail who has to 'consider' which joint products in what manner. This includes the full range of environmental policy instruments, for instance:

- 1) prohibitions and technical instructions ('command and control'), e.g. such that: the creation of a particular joint product must be avoided by appropriately modifying the production system or by shutting down the production of the corresponding main product, or if it is created, it must be transformed into something non-harmful, such as sulphur-dioxide into plaster, or it may only be created in certain amounts;
- 2) market-based instruments and incentives, e.g. a fee is to be paid for the production and emission of the joint product, or a tradable permit is required for the emission of the joint product, or a subsidy is paid for the development of a new technology that avoids the joint product;
- 3) specific liability laws, i.e. if damages should occur from any product or joint product within a certain time period, the producer can be held liable for them in specified ways.

In any case, whatever the economic agent cannot assume responsibility for reverts back to politics. Ultimately, it is the political system which remains responsible for the political community as a whole and for the natural foundations of its existence" (Baumgärtner et al. 2006: 263-265).

### 3.3 Summary and two conclusions

"In this concept, we have developed a new perspective on environmental politics which is relevant for politics as a whole. This perspective was derived from relating the concept of responsibility – an expression which has its place in the humanities and in practical



philosophy – to the physical phenomenon of joint production. In doing so, it becomes clear that responsibility and joint production display significant terminological analogies.

Above and beyond this analogy, it becomes clear that the phenomenon of joint production poses new challenges for taking responsibility for human activity. This holds, in particular, for politics and those persons who are involved in it: They bear the most comprehensive form of responsibility – political-ethical responsibility. As we have demonstrated in Chapter 2, politics is always at risk of arriving at a tragic conflict or becoming entangled in the complexity of the consequences of its actions (see Section 2.7). This danger arises mainly from the fact that our activity is subject to conditions of irreducible ignorance [see also Baumgärtner et al. 2006: chapter 12].

The particular dangers of political activity are nothing new. Yet, for a long time, these dangers had only been taken into account in social affairs, that is, in the interactions among people. Something different appears to be the case with regard to our relationship to nature. This relationship was often seen in two different but equally simplistic ways: Either we are subject to natural phenomena and at nature's mercy [EVOLUTION], or we control these phenomena and thus reign over nature. Singular problems for responsible behaviour do not seem to arise in either case. The concept of joint production shows us, however, that both views of our relationship to nature are misleading. We are neither simply subject to nature [TELEOLOGICAL CONCEPT OF NATURE], nor are we her sovereign lords. In the course of human production, we intervene in nature and subjugate her. By simultaneously giving rise to joint products with every product we produce [JOINT PRODUCTION], however, we instigate natural processes which are beyond our control. We act, as Arendt (1958) puts it, 'into nature' and nature responds as an autonomous counterpart. This leads to two conclusions.

### Conclusion 1: Irreversibility in nature and in the social sphere

The same problems confront politics in the field of the natural environment as in the social field. Even if we solely regard the natural environment, i.e. if we neglect the interests of the economic and political actors involved, politicians find themselves confronted by an unmanageable complexity of the consequences of their actions. This circumstance is even more momentous since interventions into nature are often irreversible. Irreversible consequences of actions also exist with respect to social affairs. However, in the social sphere there are ways to partly neutralize the irreversible consequences of individual actions. In the economic domain, the traditional approach is that of monetary compensation. Arendt (1958: 236) points out another 'remedy against the irreversibility and

unpredictability of the process started by acting', by which the consequences of actions may be reverted – namely the human 'power to forgive'.

Evidently, neither of these ways holds for irreversible interventions into nature. Although we may have good reason to hope that nature will be able to physically neutralise negative consequences of our actions to a sometimes surprisingly large, but limited extent, nature cannot be compensated in monetary terms, and it cannot forgive.

*'Modern natural science and technology, which no longer observe or take material from or imitate processes of nature but seem actually to act into it, seem, by the same token, to have carried irreversibility and human unpredictability into the natural realm, where no remedy can be found to undo what has been done'* (Arendt 1958: 238).

### Conclusion 2: Responsibility of individuals and politics

Since the consequences of joint production are often not foreseeable and also irreversible, we can draw a second conclusion: The multifarious responsibility related to the phenomenon of joint production must be borne both by the economic agent and politics. For, in a modern economy it is above all the economic agent who produces, thus intervening into nature. Yet, this responsibility is always too great for the individual economic agent. For this reason, there remains a problem in politics. A framework has to be developed which allows us to restrict accordingly the responsibility and hence the freedom of the economic agent. To this end politics, science, and the public must fundamentally rethink how to divide up the enormous burden of responsibility which arises from economic activity through the phenomenon of joint production, between politics and the individual economic agent" (Baumgärtner et al. 2006: 265- 267).

## 4. Literature

The content of MINE originates from scientific work published in books and peer-reviewed journals. Quotes are indicated by a special typographic style.

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Baumgärtner, S., Faber, M. and Schiller, J. (2006), Joint Production and Responsibility in Ecological Economics. On the Foundation of Environmental Policy. Edward Elgar, Cheltenham.

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## 4.1 Recommended literature

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