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Dialogic Global Studies for multicultural technology assessment

Dialogic Global
Studies

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Abstract

Purpose – The purpose of this paper is to show a practical case of dialogic web-based learning that has provided a set of questions analysing two complex technological projects in “southern” countries with effects on multicultural equity.

Design/methodology/approach – Structured online review processes in multicultural and systems science curricula allow for high density of literature-based reflection and analysis.

Findings – The entirety of the set of over 50 questions developed by the proposed web-based dialogic procedure represents a starting point for an in-depth assessment of the effects of deploying “northern” technology in “southern” countries.

Research limitations/implications – The present case study concentrates on energy technology, notably on two hydroelectric plants presently under construction in Ilisu, Turkey, and Belo Monte, Brazil.

Practical implications – The multitude of questions calls for complex technological construction projects that have to undertake sound interdisciplinary in-depth analysis of technological, environmental, economic, cultural and social consequences in order to secure a necessary level of economic, environmental and social sustainability.

Social implications – Application of widely accepted planning tools such as technology assessment, environmental impact assessment and strategic environmental assessment are useful but have to be complemented by analogous tools at a cultural and social level.

Originality/value – This case study operates through questioning, largely in the Socratic tradition. Questions may trigger a broad discussion process within civil societies – which is the intention of the present text.

Keywords Turkey, Brazil, Developmental cooperation, Hydro-energy, Energy technology, Technology assessment, Questions, Ilisu, Belo Monte

Paper type Case study



Introduction

During interdisciplinary web-based university practicals organised according to the didactic schedule of “jet principle in e-learning” (Ahamer, 2011, 2012), all the following “questions to Andritz” have been authored by the participating alumni, graduates and

students from several curricula and universities named as co-authors of the present paper. The intention of this procedure was to create a multiparadigmatic view on complex socio-economic issues of globalisation (symbolised by the globe in the centre of Figure 1) while views stem from various academic disciplines (viewer symbols based in different colours symbolising the different disciplines of the curriculum). Two case studies pertain to energy supply projects and focus on the role of one involved company, located in Andritz near Graz, Austria. Over 50 questions open a dialogic space for multidisciplinary assessment.

Two case studies of globalisation: the hydroelectric projects of Ihsu and Belo Monte

Description of the Ihsu project

The Ihsu dam (Figure 2) is part of the “South-Eastern Anatolia Project” (Turkish abbreviation: GAP), which was originally planned in the 1970s to consist of projects for irrigation and hydraulic energy production on the Euphrates and Tigris. Later on in the 1980s this project was transformed into a multi-sector social and economic development program for the region that contains sectors such as irrigation, hydraulic energy, agriculture, rural and urban infrastructure, forestry, education and health (GAP, 2011; Bosshard, 2012).

Among the 22 dams and 19 hydraulic power plants of the GAP, the Ihsu dam is listed as having the third highest performance with an installed capacity of 1,200 MW and an annual generation of 3,833 GWh (Aschemann *et al.*, 2008, pp. 172-243 and A1-A28; USW, 2012; Corner House, 2000a, b, c, 2001).



Figure 1.
The combination of logos for interdisciplinarity (colours of faculties at Graz University) and for multicultural perspectives (rotating viewing angles) from Ahamer (2012) graphically symbolises the approach of this paper: multiperspectivism

Furthermore, the following declaration from the official GAP webpage's statement should be mentioned:

The project rests upon the philosophy of sustainable human development, which aims to create an environment in which future generations can benefit and develop. The basic strategies of the project include fairness in development, participation, environmental protection, employment generation, spatial planning and infrastructure development (GAP, 2011).

Nevertheless, international financing for the realization of the Ilisu dam was rejected by the World Bank because of its negative impact on environment and society. In December 1999, four requirements were set by export credit agencies (ECAs) as a precondition for a positive financial guarantee which were as follows:

- Creating a resettlement plan in accordance with international standards.
- Provision of sewage treatment plants to ensure water quality.
- Insurance for adequate drainage.
- Planning for the conservation of the archaeological heritage of Hasankeyf.

Because of numerous requirements that were not fulfilled this endeavour ended without success in 2002 (Aschemann *et al.*, 2008; KHRP, 1999, 2002, 2007; Ronayne, 2005; PWA, 2001).

Negotiations with another consortium were started in 2003 with VA Tech Hydro (later part of Andritz Group) and ECAs from Germany, Austria and Switzerland. An expert report ordered by the government of the three countries resulted in a devastating outcome: almost all of the 153 requirements had been ignored by Turkey, which led to the withdrawal of the ECAs in 2009 (Wikipedia, 2012).

In 2010 Turkey announced that they had found new financial creditors and that the dam could still be built (Wikipedia, 2012). Despite all criticism, the Austrian Andritz Group is supplying the dam with six Francis turbines, six generators, additional equipment and engineering services (Andritz, 2010).

Description of the Belo Monte project

The Belo Monte dam (Figure 3) is another project with which the Austrian Andritz Group is involved; this is a hydroelectric dam complex under construction on the Xingu River (southern tributary to the Amazon) in the state of Pará, Brazil. The Belo Monte



Source: GfBV (2003), RiverNet (2012), BBC (1999); at right: situation for the city of Hasankeyf that is planned to be flooded up to the top of its minarets; WN (2012)

Figure 2.
At left: location of the Ilisu
dam project on the Tigris
River in South-Eastern
Anatolia, Turkey



Figure 3.
At left: location of the Belo Monte dam project on the Xingu River in Altamira, Brazil

Source: BBC (2010), Maisonet-Guzman (2010), Latina Press (2012); centre: panorama of planned channels, as long as the Panama Channel; Intercontinentalcry (2011), Youtube (2012); at right: human chain on the earth dam reading “Stop Belo Monte”; Amazon Watch (2012), Wordpress (2012); photo credit: Atossa Soltani/Amazon Watch/Spectral Q

project is a highly complex system consisting of two dams, one artificial canal, two reservoirs, one of them on dry land, and furthermore an extensive system of dikes, some on a scale big enough to qualify as large dams (Banktrack, 2012).

With a planned installed capacity of 11,233 MW (Megawatt), it would be the second-largest hydroelectric dam complex in Brazil behind the Brazilian-Paraguayan Itaipu Dam, while globally it would be the third-largest in installed capacity, behind the Three Gorges Dam in China. The guaranteed minimum capacity generation from the dam is predicted to measure 4,571 MW, 39 per cent of its maximum capacity, due to the oscillations of the river flow. Electricity generated by the dam’s turbines will be distributed throughout the country via the main Brazilian power grid, in order to meet the demand of energy required (in the view of some stakeholders) by Brazil’s rapid economic growth calling for new sources of energy (Wikipedia, 2012).

Since the first plans in 1975, a long history of controversy has accompanied the project including weaknesses in the impact assessment (considered as incomplete), federal court battles and a social movement fighting against the project. The current status is that the construction has been allowed because it is based on five different environmental technical reports, according to the Environmental Impact Report (Wikipedia, 2012).

Belo Monte would divert the flow of the Xingu River, devastate an extensive area of the Brazilian rainforest and severely impact indigenous villages and important areas of biodiversity, as well as irreversibly impacting the Xingu’s fish stocks. Furthermore, over 20,000 people will have to be displaced and the survival of indigenous peoples in the affected area will additionally be under threat (International Rivers, 2012).

Besides environmental movements and NGOs, the UN Human Rights Council has also released a statement whereby the attitude towards, and treatment of, the affected indigenous people by the Brazilian government in addition to the careless constructing are strongly criticized (Wikipedia.org, 2012).

The Andritz Group significantly contributes to Belo Monte, namely totalling an order value of approximately 330 million Euro: three Francis turbines and generators, 14 excitation systems for the main power house, six bulb turbines and six generators, all auxiliary equipment and other hydro-mechanical equipment for the Pimental power house (Andritz, 2011).

Participants in the construction projects

In general, the Austrian Export Credit Agency (ACA) insures export liabilities and “non-market risks” such as political uncertainties or insolvency on behalf of, and with securities given by, the Austrian Ministry of Finances. This instrument aims to support Austrian companies in order to be more competitive in project acquisition and execution on an international level. By law this support is to be granted for projects in the environmental protection, waste disposal and infrastructure sectors in particular. In 2006 the ACA took liability for the project “Ilisu” by the Andritz AG, but – for the first time(!) – later withdrew, after concerns of non-compliance to the contractually agreed standards that had been confirmed (OeKB, 2012; ENS, 2009). Beforehand, the two involved ECAs from Switzerland and Germany had already withdrawn from the project and protest from the general public had arisen in several countries. This decision reflects the concerns for the sustainability of a project that is unlikely to have been approved according to Austrian law. The Ilisu project, however, is still being built in a consortium with Andritz, but without support of the ACA. Now with the power plant project Belo Monte, Andritz AG is again being heavily criticized for its involvement in a project in a very environmentally and socially sensitive area.

This raises the question whether an Austrian company being supported by legal instruments should not also be bound to a “code of conduct of the general public”, in the sense of Austrian values also being exported along with Austrian products. This could be done, if approval is taken into account not only on a project level but also on a company level for sound and sustainable business practice.

The questions to participants in the project*Economic issues*

- (1) How does Andritz AG deal with criticism directed at projects such as Ilisu or Belo Monte in Brazil? To what extent is, e.g. the native population in Brazil informed, consulted or compensated? Are there plans to encourage public discourse in the future, e.g. outside company or in collaboration with external bodies?
- (2) What was the firm’s approach, in the case of the Ilisu project, in regard to the positive results such as the creation of employment on the one site and the displacement of the farming communities or the mandatory resettlement of the people on the other side (ECA Watch, 2005)? How did Andritz decide which consequences are more acceptable or carry more weight?
- (3) Does Andritz perceive a stronger need to justify facing its customers or the general population, regarding their involvement in the Ilisu dam project or their controversial projects such as Belo Monte or Rio Madeira?
- (4) Due to the lower final financial statement of major projects, revenues and profits in the last three years (annual report Andritz AG from 2009, 2010 and June 2011) seem to have significantly decreased. The Ilisu project should bring Andritz AG a turnover of 340 million euro over seven years, for total project costs of EUR 1.1 billion. In a conversation with APA, its CEO said that Andritz AG is not the only remaining European supplier and that Chinese competitors could easily step in, since they have supplied turbines three to four times the size to other projects. This raises the question whether a negative environmental impact and a poorly planned resettlement of people seem a sufficient argument for Andritz AG to make the decision to withdraw from this project?

(5) A central component of your corporate policy is “to meet the needs of the present generations without compromising the ability of future generations”. Looking at the population of the Brazilian rainforest, the construction of the dam would affect the livelihood of more than 40,000 people (Südwind, 2012). However, there are no concrete offers of compensation for up to 4,000 people who must cede their homes and their livelihood to the dam (Kandler, 2011; recipient of the Alternative Nobel Prize in 1991):

A part of the approximately three hundred thousand inhabitants of the region is hoping for improvement. On the other hand, many fear social problems such as alcoholism, crime, prostitution, land conflicts, etc. due to the uncontrolled influx of an estimated one hundred thousand people (mostly young men looking for work).

For the implementing companies, among which is included the Austrian company Andritz AG, Belo Monte is a lucrative business. The Brazilian government called the mega-dam simply a “necessity”. Until 2019, the following increase rates are expected: production of aluminium by 130% to 235%, production of cellulose and cement by 190%. Supplying these highly energy-intensive and export-oriented industries may require the energy sector to grow annually by 6.5%. 68% of these growing energy needs will be met by hydroelectric power. Industrial firms are already provided with extremely low electricity rates. Household customers, however, and with this is included the poorest strata of the population, pay sometimes ten times more for each kilowatt-hour. We also benefit from them in the rich North: cheap energy and raw materials attract the globalised economy to countries like Brazil, whose governments are prepared to sell them while damaging their own population and natural resources.

The dam will flood 640 km², but its volume of water guarantees the full operation of the proposed turbines for only three to four months. Therefore, it is fairly certain that at least one dam is built further upstream which has more than 6000 km² and a water level varying seasonally by 10-23 meters in depth – a tremendous source of the greenhouse gas methane.

To what extent is the “theoretical” corporate policy complying with practice? Will today’s residents and, subsequently, the future population not be exposed to a rather grave threat?

(6) Participation in the construction of the Belo Monte project brought criticism from the side of NGOs and politicians. How can the Andritz Group, particularly on the basis of its claimed target of sustainability (e.g. economic sustainability) justify their participation in the project? Or do the negative arguments outweigh the positive? Is it a strategy of economic sustainability that a project, once started, also has to be brought to an end? Or is it perhaps a better interpretation of sustainability not to have started this project at all at the outset, because of the image and the associated consequential loss of (symbolic) value of the company?

(7) “Andritz has the objective of generating more than 50% of the annual turnover in the renewable energies sector” (Andritz, 2012f). Is this objective at the core of the company’s philosophy, or is it a conscious strategy to increase revenues and profits based on the boom of the global ecological movement?

(8) Milton Friedman, an American ultra-liberal economist, speaks about an “economic arbitrariness freedom”, where the boundless freedom of powerful people discriminates against the less privileged. How does Andritz stand regarding this philosophy in matters of the power plant projects Belo Monte in Brazil and Ilisu in south-east Anatolia?

In 1970, Friedman wrote an essay published by *New York Times Magazine* with the title: “The social responsibility of business is to increase its profits”. Is the social

responsibility of Andritz also to increase its profits, in the sense that profit maximization is a “moral obligation”?

(9) Many global industrial groups outsource their production facilities to low-wage countries. What argument does Andritz convince to employ about two-thirds of manual workers in Europe and Northern America? And why is the headquarters of Andritz in this respect still in Graz?

(10) In Austria, the participation of Andritz in the Belo Monte dam project in the Brazilian Amazon region is not only criticised by NGOs such as the World Wide Fund for Nature (WWF), Dreikönigsaktion (DKA) and Südwind (in German: Southern Wind). Member of Parliament (MP) Petra Bayr of the Social Democratic Party (spokeswoman for Global Development) and Member of Parliament (MEP) Ulrike Lunacek of the Greens (foreign affairs spokesperson of the Greens/European Free Alliance EFA in the European Parliament) also take position against Belo Monte on behalf of their parties and thus for a considerable part of the Austrian population.

Would it not be a more helpful strategy, and in particular more goal-oriented in the long term, to invest any added value generated into symbolic capital rather than into a more medium-term economic growth? According to Südwind, the Austrian international politics, culture and development magazine which has the largest circulation, Andritz AG shows a “dream record” with regard to its 2010 balance sheet. According to Pierre Bourdieu, economic capital can be converted into symbolic capital, i.e. recognised by the community (reputation, prestige, honour). The withdrawal of Andritz AG undoubtedly would represent an act of social marketing with effects hard to quantify, but nonetheless positive.

Human rights

(11) The Andritz Company published on its homepage a Code of Business Conduct and Business Ethics. In chapter “4.4.2 Sustainability” one can read the following sentence: “We respect human rights and support the principles of equal opportunities, irrespective of race, nationality, gender, sexual orientation, religion, disability or age”, additionally one can read that the Andritz Company acts as a [...] “good global, national and local citizen” [...] and [...] “the Andritz AG follows the spirit of the environmental laws and regulations in each country they act in” (Andritz, 2012a, p. 16). Andritz participated in the Ilisu dam project in Turkey, the Belo Monte project and the Rio Madeira dam in Brazil. For all these three projects ECA Watch (2008) noticed that people are forced to move from their home and that habitats and biodiversity will be destroyed (especially in the rainforest), which generated harsh criticism from the public (ECA Watch, 2007). In this context, we should ask the question why the Andritz Company continues to adhere to these projects, when they receive such highly lucrative orders without regard to the consequences.

(12) Are there any control mechanisms in place concerned with defending the human rights of the local populations? Is it possible for Andritz AG and the other cooperating companies to influence the human rights situation of the local inhabitants?

(13) Regarding the catchword “social sustainability”, you state on your homepage: “Companies like Andritz that have a strong sustainability policy must pursue the goal of free and open markets with stable societies and fair distribution of economic benefit for everyone” (Andritz, 2012d):

- How is this statement compatible with the controversial Ilisu dam project in Turkey, where economic disadvantages for the resettled population (job insecurity, missing

compensation for lost lands, etc.) (Setton *et al.*, 2005, p. 5-7) as well as the negative impact on adjacent countries such as Syria and Iraq (WEED, 2012), which are currently politically unstable, have already resulted or are anticipated?

- What are the underlying considerations on which decisions for or against participation in such projects are based? Do you offer compensation for affected people, such as compensation payments or social projects?

(14) Social sustainability – a marketing strategy? – According to the principle of social sustainability, Andritz (2012d) has a social responsibility towards their individual employees. The key issues are therefore health and safety at work, opportunities for further training and the well-being involvement of employees. “The ultimate goal is social progress achieved on the basis of a good ecological balance” (Andritz, 2012d). As a result of above-mentioned social sustainability, the employees of Andritz AG should not be exposed to (psychological or physical) risks.

Therefore, fair pay and working hours (security), and especially the respectful treatment of fellow employees (involvement) can be assumed. Now Andritz AG is involved in the Belo-Monte dam project in Brazil. According to local Roman-Catholic Bishop Kräutler and the platform Belo Monte, the prevailing working conditions are not reasonable:

The workers who were hired with lots of promises start working at four o'clock in the morning and return at eight or nine in the evening. The buses in which they go to work do not even offer a minimum level of comfort. These working conditions make a mockery even of the Brazilian labour legislation. Overtime is not remunerated and family visits are permitted only after six months. People work night and day, Saturday and Sunday (Kräutler, 2012).

How can Andritz AG reconcile such working conditions with the principle of social sustainability?

(15) In connection with the dam project, Belo Monte human rights violations have been increasingly documented, in particular the right to information and participation. As has been stated properly from the side of social organisations, this is not only a violation of the ILO Convention on the Rights of Indigenous Peoples, but also a violation of the Brazilian Constitution.

Given the above, how does Andritz AG justify its repeatedly postulated confidence in the Brazilian constitutional state, implying that a separate analysis of the situation by Andritz AG would be superfluous?

Sustainability

(16) Andritz's company homepage states: “Our strong belief is that only businesses living up to their social, economic, and environmental responsibilities can be sustainable” (Andritz, 2012e):

- The term “sustainability” is much discussed in literature and interpreted in different ways. How does Andritz understand this term? What do you understand as your social, economic and environmental obligations?
- Do you consider the motivation to act in a sustainable manner anchored in the corporate culture? To what extent can your focus on sustainability be seen as a reaction to requirements of external stakeholders, such as customers, the public, or legislation?

(17) The Andritz Company is, according to the homepage (Andritz, 2012b) one of the world's leading corporations in fields like hydropower and pulp. According to the Code of Business Conduct and Business Ethics (Andritz, 2012a), the principles of sustainable development are an integral part of the group. As is written in a report by the non-governmental organisation (NGO) World Economy, Ecology & Development (WEED), which published a study of the Ilisu project commanded by a member of the European Parliament in the year 2005, it is expected that in the current socio-economic and political climate, the Ilisu dam will not succeed as a project. WEED furthermore added that, after construction of the dam one can expect that:

- “the living conditions of several tens of thousands of people will deteriorate dramatically;
- human rights are violated on a massive scale;
- the conflict potential for water in the Middle East will increase;
- unique cultural heritage will be destroyed;
- massive and irreversible environmental destruction will be caused; and
- Turkish law and international standards are violated” (ECA Watch, 2005).

A web search for the Ilisu dam project by “Google”, yields over 8,800 hits in which the project is described by the Austrian media landscape (e.g. ORF, derstandard, europanews, diepresse, Kleine Zeitung, etc. as well as by NGO's) as one of the most controversial projects in the world. Regarding the principles of sustainability, which are published on the web site of Andritz AG, the feeling arises that these principles stands only for the image of the company and have nothing to do with their everyday labour. The question arises: apart from economic benefits for Andritz AG, why is Andritz AG the only European company which is involved in this project, despite massive environmental and social ills? (Standard, 2010a).

(18) In the last few years, national and international companies have often been accused of using the topic of sustainability as a PR gag (also called “greenwashing”), in order to gain a better reputation with the public. What are your arguments for disproving the accusation that there is a kind of greenwashing practice at Andritz AG?

(19) The Andritz HYDRO Company is an associate of a corporate platform called respACT – Austrian business council for sustainable development. This platform supports the corporate social responsibility (CSR) of its Austrian member companies (respACT, 2010).

How is the Belo Monte project now compatible with the guidelines of respACT (2010)? This project was the reason for several accusations concerning the firm's handling of indigenous peoples. It is alleged that Andritz did not inform these people about its purposes, and are furthermore responsible for 30,000 people having to be relocated because of the flooding of 500 km² (Standard, 2011; Südwind, 2011, p. 8)? What is respACT's reaction to these reproaches? Is Andritz expecting any consequences?

(20) Andritz AG considers itself a sustainable company, which signifies social, ecological and economical responsibility (Andritz, 2012e). How are these three pillars partitioned within the company? Is there a clear demarcation or is more attention emphasised on the economical aspect? Are there any external institutions which verify their integrity?

(21) In Andritz's annual report for the year 2005, one can read in the chapter on "Sustainability and the Environment" the following note: "Implementation of the business in a socially responsible manner" (Andritz, 2005). What does Andritz AG understand this point to mean? How did Andritz operationalise their organisation's goals, and which application procedures are behind this process? What recognized methods of assessment of unexpected and undesirable effects have been shown to be applied within Andritz AG to provide resilient, internationally presentable evaluation results? Or is it merely "assumed" that the Turkish authorities are working correctly? To what extent does CSR exceed a mere declaration? Did Andritz AG carry out necessary and required assessment reports, or do they not exist at all? According to the ethical values defined, declarations must be backed by scientifically based numerical calculation models such as cost-benefit analysis, and furthermore environmental impact assessment (EIA) and strategic environmental assessment (SEA). Which one of the evaluation methods recognized by the international scientific community in (energy) technology and (construction engineering) did Andritz use? Are internal assessments always transparent?

(22) The web site of Global 2000 (2012) shows information relating to the participation of Andritz AG in the dam projects in Turkey and Brazil as well as in the construction of a pulp mill in Tasmania. This web site informs that Andritz AG led the construction consortium in this Iisu dam project for years and that the company was involved in the organisation of financing. Furthermore, Andritz AG stated its intention only to participate in this project if the international standards were adhered to. In the year 1999, the British export credit agency Export Credits Guarantee Department (ECGD) provided two expert reports on the difficulties in relocating affected inhabitants and on EIA. The conclusion of these reports was that the project does not comply with the relevant standards of the World Bank and the OECD. The Swiss Export Credit Agency (ECA) commissioned former World Bank employee and sociologist Dr Ayse Kudat, who carried out one other environmental impact assessment in April 2001. This study showed that the design of the project is still far from reaching international standards. Such an assessment remains valid to this day. According to its self-declaration, Andritz AG is presently involved in the project "only" as a supplier of the electromechanical equipment. Does not this participation contradict the declared corporate sustainability policy of Andritz AG?

(23) "I have always defined Belo Monte as a 'stab into the heart of Amazonia'". By these words Bishop Erwin Kräutler, assesses the Belo Monte dam project. Kräutler is laureate of the Alternative Nobel Prize, Austrian citizen and Bishop of the Xingu region, Brazil's largest diocese, in which the Belo Monte project is situated. He speaks of a domino effect: Belo Monte is just the first element in a larger system. On the Xingu River alone, already three more dams are to be built, the whole of Amazonia should expect more than 60 such projects within the next 20 years according to the NGO International Rivers.

Is Andritz AG concerned that their involvement in the "beginning of the end of Amazonia", the largest forest area in the world, invaluable for global CO₂ storage in times of anthropogenic global climate change, does not only harm the image of Andritz in the long term? As a result, even in Austria jobs could ultimately be at risk because of loss of reputation.

Environment

(24) On the corporate web site of Andritz AG, among other things, statements about the company's commitment to sustainability can be found. The "Code of Business Conduct

and Business Ethics”, which can be downloaded from the homepage, contains the following definition of sustainability:

We are committed to promoting environmental, social and economic sustainability. We offer technologies that either prevent pollution or minimize waste by re-using by-products from other processes, and develop systems that make the best possible use of resources (Andritz, 2012a, p. 5).

In relation to this point, my question is:

How do you feel about the accusation that the Ilisu dam project in South-Eastern Anatolia, in which Andritz AG is involved through the construction consortium and the delivery of major components, will lead to a deterioration of the water quality of the dammed river, because as a result of the construction of the dam, many factories, cities and villages, as well as landfills will be flooded, so that enormous quantities of pollutants will get into the water cycle?

Isn't this a big problem for the allegedly growing fishing grounds in the region, often communicated as a positive aspect?

(25) A study by “World Economy, Ecology & Development” (WEED) shows the enormous negative ecological impacts from the Ilisu project, in which Andritz is also involved (Setton *et al.*, 2005, p. 11-14; Counter Current, 2011):

- How do you reconcile these accusations with the principle of ecological sustainability that you are committed to, according to your company homepage (Andritz, 2012c)?
- Do you understand ecological sustainability only as those impacts that result from the utilization phase of your products, or do you also consider aspects like sourcing of materials, production, or waste disposal? From your point of view, where do the main problems lie?

(26) Once the Ilisu dam is complete, the republic of Turkey might possess a huge “ecological weapon”, because the dam will enable them to control the amount of water flowing to their neighbouring countries. Turkey could then use the dam and its regulation as political leverage against Iraq and Syria:

- How do you see this point in relation to the possibility of Turkey being able to artificially create droughts in its neighbouring countries?
- What is your company's opinion in relation to the notion of a war on drinking water and the endangered regional peace as a potential result of the dam project?

(27) On the one hand, Andritz AG publicly appears to be a company that utilises modern and environmentally friendly technologies. Its statements such as “sustainability, environmental protection and social responsibility as essential components of the Group” or “the principles of sustainable development are an integral part of our company policy” can be read in the annual reports of Andritz AG (Report of 2006 on global responsibility).

On the other hand, this company is facing massive criticism by NGOs: “While Andritz AG in Austria is celebrated as a showcase company regarding sustainability, the name Andritz AG is known abroad for the destruction of the environment and human habitats”, Greenpeace, Global 2000 and ECA Watch stated in a press release:

In order to implement the projects of the company, tens of thousands of people have to be displaced, cultural monuments have to be destroyed and hundreds of unique animal and plant species will become extinct (Standard, 2010b).

Is this criticism justified? Do the sustainable and environmentally friendly technologies mentioned by Andritz relate only to products which are manufactured and supplied by Andritz AG, or also to the projects in which Andritz AG are involved?

(28) Failure to conform to ethical principles ultimately led to numerous protests, targeted to stop the project. The indigenous population, numerous local NGOs, the WWF, Greenpeace (2012), Bianca Jagger as an activist (Huffington Post, 2012) and in particular the Austrian catholic children's group (Jungschar, 2011) are involved (among others) in the protests. It came to momentary halt until December 2011 because of a temporary stop in construction procedures.

The complaint of a fish-farming association has been repealed, as if the project would not affect the life of specific fish species (Wirtschaftsblatt, 2011). On a factsheet of Jungschar's Dreikönigsaktion (2011) however, it can be read that in general, fish stocks will be reduced and consequently thousands of fishermen would lose their means of livelihood (Wirtschaftsblatt, 2011). The halt has been repealed, but the protests go on. How does Andritz AG deal with these protests?

(29) Under the item "Environmental Sustainability", the web site of the Andritz Group especially contains goals for environmental protection, specifically energy efficiency and waste management (Andritz, 2012c). But these are only two of the many points that affect ecological sustainability. What measures of internal environmental protection will be made in Graz at the company's location? The declaration cites two large areas with environmental potential, but no concrete actions.

(30) For years, Andritz has kept being conferred the "Ecoprofit" certificate from the city of Graz (Ökoprofit, 2012), which is a "sign of the successful efforts of a company for modern environmental protection". Looking at the environmental consequences that have resulted from the Iisu project (such as habitat loss, endangered species, etc. see Aschemann *et al.*, 2008), the question arises: "In what exists the positive link between ecology and profit?". Could it be that the term "ecological" is being used as a veneer in order to justify profits and gains?

The definition of Ecoprofit reads:

Ecoprofit businesses stand out for their commitment to the environment and innovation that goes far beyond the legal obligations. Thus, they take a leading role and stand for future-oriented business with respectful consideration of environment and society.

The goal is to reduce operational emissions, conserve natural resources while reducing operating costs (profit for the environment and the economy). Thus, Ecoprofit can be seen as a model for sustainable economic development of regions (Ökostadt Graz, 2012).

On your company web site, you write regarding sustainable economic development (Andritz, 2012e):

We understand sustainability as endeavouring to meet the needs of the current generation, but without compromising the opportunities open to future generations. In addition to social progress and ecological balance, economic growth is also a mainstay of sustainable development.

Andritz AG continues to receive and accept prizes for their technology, but according to a press release this is not justified in light of Andritz's corporate policy (ECA Watch, 2012).

This text says that even if Andritz is the recipient of the “Ecoprofit” distinction and the State Environmental Prize, the fact that the company participates in environmentally destructive projects should not be overlooked. Such honours pertain to some of the company’s products, not to the company policy and exactly here lies the problem.

The social and ecological balance in the three major projects Ilisu (Turkey), Belo Monte and Rio Madeira (Brazil) is (Westerhof, 2012):

- Expulsion of 85,000 to 100,000 people.
- Elimination of 100-150 species.
- Destruction of about 210,000 acres of unique natural and cultural landscape.
- Destruction of the ancient city of Hasankeyf and other cultural treasures on the Tigris.

Water availability

(31) The large-scale irrigation and reservoir plans of the GAP project interfere with the fundamental interests of Turkey’s neighbouring countries, namely Syria and Iraq. In order to prevent serious conflict pertaining to accessibility of cross-border water resources through intergovernmental cooperation, a number of legal instruments exist on the international level. Basic principles are, e.g. detailed preliminary information and consultations of downstream states in projects on transboundary rivers. This has to be regarded as a fixed customary law, which is reflected in a variety of contracts, such as, e.g. an agreement between Turkey and its neighbours. Nonetheless, Turkey does not use these international principles in its GAP planning procedures. Turkey also refused to sign the UN convention on the non-navigable use of cross-border waterways, in which the Contracting States give assurances not to harm residents on the lower reaches of the river. The Turkish government conducts its handling of the water resources of the Euphrates and the Tigris as far as possible with a “right of the stronger” attitude and justifies its approach strictly serving national interest according to the principle of absolute territorial sovereignty. Therefore, Turkey considers any kind of consideration of other countries’ interests as a voluntary concession. It defines the Euphrates and the Tigris as cross-border water bodies but not as international water bodies. In the case of the GAP, the latter definition implies legal obligations in dealing with other states, which Turkey is not ready to acknowledge. Therefore, also in its GAP policy the Turkish government has mostly acted on national interests at the expense of those of other countries. This is illustrated by cases in which the rationing and adjusting of the contamination of the water has already occurred as a consequence of the GAP project:

- In Syria the rationing of drinking water has become necessary, because the dams of the GAP have decreased the drainage of the Euphrates so far by almost half.
- Without fixed contractual regulation, a minimum flow of 500 cubic meters of Euphrates water per second to the Turkish and Syrian border was agreed in 1987; but by the end of the late 1990s this level had been significantly reduced without renegotiation by Turkey (Hildyard *et al.*, 2000, p. 70). The reasons for this were persistent droughts over several years in Turkey, a low level in the reservoirs that caused the hydroelectric power plants to be less cost-effective.

In order to avoid these problems in the future, a study has been created as an alternative solution; namely to build five smaller dams on the Tigris and its tributaries instead

of one mega dam. This study was presented in June 2010 in Ankara under the name “Investigation of alternative solutions to Ilisu dam and HEPP” at the second international conference on nuclear and renewable energy resources by the Middle-East Technical University in Ankara (METU). The benefits of this alternative (in comparison with the mega dam) are (Table I, Yalçın and Tığrek, 2010; Hasankeyf Matters, 2012):

- The amount of electricity generated would be the same.
- Lower construction costs.
- The flooded area would be 27 per cent lower.
- Hasankeyf would not be under water.

What is Andritz’s opinion of this study? Should you, as an international company, as one of the participants in this project, as a supporter of international standards, consider and support these proposals? Do you think that this alternative is a possible solution to the existing problems in Hasankeyf, or could it constitute a path to a solution for the realisation of the project?

Ethical values

(32) “Sustainability has always been an important part of the corporate policy of Andritz. It is reflected in the daily work of each Andritz employee and in the implemented management systems and business processes of the Andritz Group.

The ‘Code of Business Conduct and Ethics’ describes the values and business principles to which the entire Andritz Group has committed itself, and which is valid for all persons working for Andritz or representing Andritz. Integrity, respect, reliability and sustainability are in its focus.

Andritz professes sustainability. [...] We are convinced that only companies which also comply with their social, economic and environmental commitments can work sustainably” (Andritz, 2012d, own translation into English, as always in this article).

For 33 undersigned groups, organisations and umbrella organisations of the Austrian civil society this public confession of Andritz AG for the paradigm of sustainable development is in conflict with the participation of Andritz AG in the Belo Monte dam project on the Brazilian state of Pará. In their letter on 26 February 2010 to the CEO and part owner of Andritz, Dr Wolfgang Leitner, the undersigned particularly refer to the socio-cultural and environmental impacts of the project on the Xingu River.

How do you see the “balance sheet” between the expected economic benefits for Andritz AG and the publicly perceived conflict with Andritz’s self-imposed rules of conduct in their “Code of Business Conduct and Ethics”?

Table I.
Comparison of the 1-dam option and the 5-dam option for an area within the GAP region by METU

	Official option favoured by the water authority	Alternative by METU in Ankara (Yalçın and Tığrek, 2010)
Number	1 dam on Tigris	5 dams on the Tigris and its tributaries
Installed power electricity	1,200 MW	878 MW
Electricity production	~ 3,000 GWh/year	~ 3,100 GWh/year
Reservoir surface	321.4 km ²	Total 235.3 km ²
Dam height	130 m	59 m, 63 m, 68 m, 71 m, 73 m
Total cost	1.85 billion euro	1.89 billion euro

(33) The World Business Council for Sustainable Development (WBCSD, 2009, p. 9) writes in its 2009 Annual Report, “Business is the main driving force for resource efficiency in the economy, for technology deployment and development and for infrastructure construction and providing financial services.” (WBCSD, 2009, p. 9):

- Is it your opinion that companies, using their (financial, material, human, etc.) resources, have to take responsibility for driving the development towards sustainability?
- If yes, how is Andritz dealing with this responsibility? Which actions are set, how is the idea of sustainability “promoted” both internally and externally?
- If no, which other entities (government/legislation, non-governmental organizations, international politics) do you consider to be responsible?

(34) Even if local worker protection were not among the responsibilities of Andritz AG, a company that prides itself on social responsibility should still apply ethical principles. By ethical principles I am talking about the increasingly universal common good, and this involves rights and duties with respect to the whole of humanity: “Each group has to take into account the needs and justified claims of other groups, in fact the common good of humanity” (Graz University, 2012). Because of the participation in the Ilisu and Belo Monte project, Jurrien Westerhof from Greenpeace is critical of Andritz AG: “Andritz AG proves with its two highly controversial dam projects – Ilisu and Belo Monte – that international ethical standards do not play any important part” (Westerhof, 2012). Andritz AG is represented at 180 locations worldwide; what does the company understand as “ethical standards” or “social responsibility”?

(35) Is “Global Ethics” necessary for the global economy, technology and politics? What could it look like and would it be capable of reaching a worldwide agreement?

Politics

(36) The construction of the Ilisu dam will enable Turkey to exert political and economic pressure on the Kurdish-populated regions in north Iraq and north-east Syria, where the majority of the population lives on farming and livestock breeding, and therefore has a high demand for water:

- What do you think about the fact that the dam offers the Turkish government more possibilities to oppress the Kurdish population in the affected region?
- Are there any plans to protect the Kurdish minority, both during the construction phase as well as after completion, especially regarding the relocated population?
- Are there possibilities at the disposal of firms and financing agencies to verify (and if necessary to sanction) the implementation of the human rights of local population?

(37) What is the company’s reaction to the reproaches of the traditional Austrian social action on the day of Epiphany (DKA, 2012) concerning the Belo Monte – project and the local demonstrations? How is the assertion of Andritz’s CEO that there is a broad consensus for building the power plant justified (Südwind, 2012, p. 8)? Which consensus is being referred to – the consensus with the approving authority? Is it not more appropriate for Andritz to build on a “real” consensus with the population and all

stakeholders? This will ensure better planning and more certainty concerning the actual practicalities (because of the high investments in this project).

(38) The posting on the homepage of the Green Party from June 15, 2010 regarding the Ilisu-Project describes the company's CSR purposes as a "PR stunt" (see the Austrian Green Party's position at Schwentner, 2012). Are there any plans to amend the bad reputation concerning social responsibility? Are there any actions which confirm the social commitment of the company?

(39) The Ilisu project is taking place in a region of political turmoil. Political strains between Syria and Turkey could lead to a war between the two countries and the Kurdish PKK shows signs of interfering (Zeit, 2012). What plans exist to secure the future of the project in case of an escalating situation? What measures have been taken to minimize financial risks?

(40) Assume one or more of your employees refuse to participate in one of your company's projects due to ethical concerns. What consequences for said employees, their seniors and the company itself would ensue?

(41) In the summer of 2012, the Rio + 20 (United Nations Conference on Environment and Development, UNCED) is to be held, 20 years after the historic Earth Summit in 1992. Sustainable Development (to which Andritz AG show their commitment in their "Code of Business Conduct and Ethics" dated July 2010) is not known to be implemented by a "large dam" (as is described the dam project Belo Monte according to the official definition of ICOLD, the International Commission on Large Dams). According to the UN World Commission on Dams, sustainable development is not perceived in any one of about a thousand of large dams they examined:

Dams have made a significant contribution to and important for human development, and the benefits derived from them have been considerable. In too many cases an unacceptable and often unnecessary price has been paid to secure those benefits, especially in social and environmental terms, by people displaced, by communities downstream, by taxpayers and by the natural environment (World Commission on Dams, 2000, p. xxviii).

Additionally, the energy policy of the United States (who have for decades refrained from the construction of large dams) shows that in particular the World Bank's model of developing mega-projects is no longer appropriate for the present day.

Would it not be more beneficial for Andritz's long-term economic development as a strong partner in Brazil, one of the emerging markets, to invest technical know-how in its energy efficiency? This question is especially pertinent given that, according to WWF-Brazil, 40 per cent of the country's demand for energy can be met by improving energy efficiency – the amount equivalent to the power generated by no less than 14 dam projects of the scale of Belo Monte (WWF Brazil, 2012).

Communication

(42) According to an article from the Austrian daily newspaper *Die Presse* from June 15, 2010 (Presse, 2012), Andritz AG is called a "disgrace for Europe" in a paper by Ulrich Eichelmann (ECA Watch) as a consequence of its continued adherence to the Ilisu dam project. The CEO of Andritz AG replied that Andritz AG will in no way be deterred by the negative publicity. "Otherwise we would be unpredictable for our customers", the CEO said (Presse, 2010). NGOs such as ECA Watch also criticize the unwillingness of Andritz AG to engage in dialogue. In this case, ECA Watch said: "Andritz must, in terms of modern communication and participation, be a constructive

part of civil society, rather than constantly rejecting discussion” (ECA Watch, 2010). How do Andritz AG deal with the constantly negative publicity? Do management deal constructively with criticism of the projects (Ilisu, Bell Bay Pulp Mill); or will the allegations, as with those of the previously described ECA Watch, be dismissed?

(43) After a two year review of the Ilisu project, the governments of Germany, Austria and Switzerland have proposed the cessation of the project. European banks and construction companies have followed suit, but not Andritz (Stop Ilisu, 2011). Why did Andritz AG not follow these suggestions and withdraw from the project?

Because of this decision, the public image of Andritz AG has continued to deteriorate, especially in relation to social and environmental values. Ulrich Eichelmann from the NGO ECA Watch says the following: “Andritz should create and follow social and ecological standards for their work in order to limit their negative impact on people and environment and stay reliable” (Eichelmann, 2011). What measures are taken by Andritz AG to get away from this negative image, which has developed as a result of the controversial dam projects?

(44) “The Global Studies master’s degree conveys holistic ways of thinking and acting in a world that is becoming more complex and dynamic” (Global Studies, 2012b). This Master’s curriculum involves practical exercises, though it mainly focuses on the communication of theoretical knowledge in fields like history, politics or environment. Which divisions of Andritz AG do you see demanding this Master’s degree as a requirement for its graduate employees?

(45) As part of its self-ascription, Andritz AG stands for sustainability (Andritz, 2012e). Is it possible to be true to this statement in times of economic competition or is it necessary to compromise in the face of current political and economic circumstances? How much effort do you put into dialogues with local people in order to ensure sustainability? How important is personal contact with local people to you and how are such dialogues taking place?

(46) Do employees of Andritz participate in lectures or courses that deal with learning about cultural differences in order to prepare them for their stay in another country? Which internal or external measures are taken in order to prepare your employees for their participation in projects that take place abroad? Do you use any kind of method to evaluate if the employees your company plans to dispatch are qualified to work and live in a different cultural setting? Which measures do you take in order to ease the transition of your employees to a new cultural setting?

(47) If one reads newspaper articles relating to Andritz, on the one hand it seems as if economic goals are in the foreground and social, ethical, environmental and cultural aspects in the background. If you read the company’s web site on the other hand, then the impression is given that the company takes a stance on social, ethical and environmental justice and sustainability. How do you explain these divergent views? How do you see this controversial picture?

Apparently there are massive differences between the theoretical approach and reality (GfBV, 2010):

- *Ecological Consequences.* The landscape of the Xingu River with its enormous biodiversity will change greatly. The region of the large river loop is susceptible to drying out leading to the decimation of animal and plant species. Fish stocks will fall. Upstream, the ecological balance will be lost due to the body of water being withheld. A standing body of water follows laws of nature other than the biological

characteristics of the present watercourse. Mosquitoes and vectors for other tropical diseases would find ideal breeding grounds in the planned reservoir. As a result, the risk of contracting malaria or yellow fever will increase. The flooded tree and plant matter will rot in the standing waters. This decaying process leads to the release of air polluting greenhouse gases.

- *Social impacts.* All of this will heavily impact on people's lives. The river landscape provides for the livelihood of many residents. The river serves as a food supplier, water source and transport path. For example, the Rio Bacajá joins the Xingu at the apex of the great river bend. If this dries, the boat traffic to Bacajá River, home of several indigenous communities, will be interrupted.

Ulrich Eichelmann writes about the project Belo Monte:

The argument that Belo Monte supplies 23 million households with electricity, is no more than the usual marketing gimmick: the energy serves not the residents but is to be used for ever more and ever larger aluminium plants in Brazil (Eichelmann, 2010).

He continues:

[...] investors are rubbing their hands, led by the shareholders of Andritz. The value of its stock rose by more than 6%, because it was expected that the Austrian company be involved in this project. This means more than 132 million €, earned by investors theoretically. On one day! The price that does not appear in the balance sheet: hundreds of animal species and plant species would forever disappear from the planet, including 100 species of fish, and 20,000 people would lose their homes.

Gender issues

(48) On the executive board of Andritz Group there is currently no woman among the five members, in the Supervisory Board there is only one woman among eight members. This corresponds to a percentage of 7 per cent, and is thus even below the Austrian average which is at 9 per cent. With this average, Austria stands at the low end of European Union states. The leader in this statistic, Norway, has adopted a law for a gender quota for Executive Boards. Also the other Scandinavian countries Sweden, Finland and Denmark, are far above the European average (AK, 2011). Additionally, in other cases these countries are also the European showcase countries. Social sustainability includes the implementation of women in management positions. Is the introduction of a fixed quota for women, or the future implementation of women in the Board an issue, or has Andritz AG other priorities for implementing social sustainability?

Culture

(49) The upper basin of the Tigris River is one of the oldest cultural regions on earth and one of the most important landscapes in human history, namely the Fertile Crescent. In this historic area cereal crops started to be cultivated and humanity's first permanent settlements developed. This region is the cradle of European and Middle Eastern culture. As a consequence of the construction of the dam, this historical valley of the Tigris River and its scientific documentation would be lost forever. *De facto*, the city of Hasankeyf is a World Heritage Site because it meets the criteria of UNESCO. *De iure*, Hasankeyf does not possess this legal status, since Turkey refuses to appeal to UNESCO for this specific title of protection. The politicians use this situation repeatedly and refer to the low value of Hasankeyf, because it is not a world heritage site in the strict legal sense.

In 2007, the Turkish-European dam consortium obliged itself to spend 30 million euro on the rescue of the historic city of Hasankeyf. The individual monuments should be relocated, but that is partly impossible due to the poor condition of the building, because each building is connected to its original environment in an immediate, significant context. This has been confirmed by many experts. One of these experts, Zeynep Ahunbay, a Turkish historian of architecture and professor at the Technical University in Istanbul, confirmed, based on the research and analysis that she had carried out, that transfer of the monuments without damage is virtually impossible:

Moving monuments is a hard task. It requires a good budget, technical means and planning. One of the most important objections to the Ilisu Dam is that there is no proper plan for the re-location of Hasankeyf, and its architectural heritage could be destroyed. Siting and topography are very important in moving monuments or parts thereof. A relocated building like Seldom has the same topographic relationship to its new site. When monuments are cut off from their foundations and erected on a completely different site, they look very different. They alienate and lose much of their dignity and integrity. Their aesthetic value is diminished. A similar landscape and context has to be created in order to make them impressive and meaningful again. There are no studies or preparations to provide a similar landscape for the monument; [. . .] One has to consider the fact that it is impossible to recreate the landscape of Hasankeyf which could be destroyed with the Tigris River in the middle and cliffs shaped by action of the water in the past several million years (Figure 2 at right). The context for the transferred monuments will be foreign; since the new site is a terrain with a small inclination. Hasankeyf could be destroyed while the landscape comprises gigantic natural elements and complex relations among its architectural members. It is impossible to recreate the picturesqueness of the background for monuments like the Koç and Sultan Süleyman Mosques (Ahunbay, 2006).

The proponents of the project like to use the argument: “We are saving Hasankeyf through the project!” Due to the already mentioned analysis and facts that are confirmed and have been carried out by the experts, but also by other organizations such as UNESCO, the question arises: what is meant by this salvation? This argument of “relocation of monuments” appears to be a marketing strategy. What is Andritz’s opinion of this analysis, and how would you justify this argument?

(50) In your “Code of Business Conduct and Ethics” respect is one of your principles. This codex says: “We respect the values and cultures of other countries and peoples, and appreciate the differences in mind-set and origin”. If you look in this regard at the indigenous population in the Brazilian rain forest, do not cultural norms and values move into the foreground? Because if you let the indigenous population speak, they say:

For living, we need nothing from the white population. We do not live on rice and beans, or bread. We live on fish and cassava. The rivers mean everything to us and if they dry out, we die also. We want to live in peace here, and we have a right to it! (Klimabündnis, 2012).

For the construction of the dam about 16,000 people would have to be relocated and an area of 500 km² would be flooded (Presse, 2011). It is doubted whether the project will actually bring progress and prosperity into the region because a large part of the electricity produced in Belo Monte will be used by export-oriented industrial companies, for purposes such as aluminium production (DKA, 2012). While entrepreneurs and businessmen fully support the Belo Monte project in the hope that money will pour in, on the other side no one cares to be inundated by the consequential damage to the lives of thousands upon thousands of residents whose houses and farmland stand to be lost.

Are not economic and profit-related factors rather more prominent than the social and ethical factors? How can you explain this business conduct “ethically”?

(51) Sustainability consists of three pillars: economic sustainability, environmental sustainability, and social sustainability. In many companies having sustainability in their code of conduct, emphasis is placed mainly on economic and ecological sustainability. Also in the Group Policy of Andritz Group environmental protection especially equates to the part with environmental sustainability (Andritz, 2012a). The social component of the sustainability is only briefly mentioned. Particularly in the training and recruitment of employees, this is, in my opinion, more a point of economic sustainability. What are the efforts by the Andritz Group to ensure social sustainability? Are there any special programs?

(52) The professional formation of Global Studies targets for example “inter- and supranational organizations” and “management of international companies” (Global Studies, 2012a). What is the specific knowledge a graduate of Global Studies should contribute to professional practice? What knowledge is of greatest relevance for the Andritz Group? To what extent is it possible to practically contribute the values foreseen in these studies, such as for example transdisciplinarity, global justice and sustainability?

Conclusions

This article shows that learning technologies, especially suitably designed web based dialogic learning strategies enable a complex, high-quality and scientifically based discourse that opens the way towards consensus of stakeholders. The 52 questions developed in this article contribute to clarification of two highly complex interdisciplinary and multicultural case studies on energy supply by providing interparadigmatic perspectives in the fields of economic issues, human rights, the environment, water availability, ethical values, politics, communication, gender issues, and culture.

References

- Ahamer, G. (2011), “How technologies can localize learners in a multicultural space”, *International Journal of Technology and Educational Marketing (IJTEM)*, Vol. 1 No. 3, pp. 1-24, available at: www.igi-global.com/bookstore/titledetails.aspx?titleid=41028&detailstype=description
- Ahamer, G. (2012), “The jet principle: technologies provide border conditions for global learning”, *Multicultural Education and Technologies Journal*, Vol. 6 No. 3, pp. 177-210.
- Ahunbay, Z. (2006), *Preservation of Hasankeyf Could be Destroyed*, A Site Threatened by Ilisu Dam Project, available at: www2.weed-online.org/uploads/comment_Ilisu_zeynepahunbahy_archeology_engl.pdf (accessed August 8, 2012).
- AK (2011), *Frauen Management Report 2012*, Arbeiterkammer, Austrian Federal Chamber of Labour, available at: http://wien.arbeiterkammer.at/bilder/d167/FrauenManagementReport_2012.pdf (accessed August 8, 2012).
- Amazon Watch (2012), “Hundreds occupy Belo Monte dam site – human banner”, available at: www.causes.com/causes/77274-amazon-watch/actions/1660416 (accessed August 8).
- Andritz (2005), “Andritz-Technologien erfüllen weltweit höchste Umweltstandards”, available at: <http://reports.andritz.com/2005/de/index/globale-bereiche/umweltschutz.htm> (accessed April 12, 2012).

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- Andritz (2010), “Andritz to supply electromechanical equipment for Ilisu hydropower station, Turkey”, available at: www.andritz.com/hydro/hy-news/hy-news-detail.htm?id=5679 (accessed August 10, 2012).
- Andritz (2011), “Andritz to supply major equipment for Belo Monte hydropower plant”, available at: www.andritz.com/hydro/hy-news/hy-news-detail.htm?id=5589 (accessed August 10, 2012).
- Andritz (2012a), *Code of Business Conduct and Ethics*, available at: http://grz.g.andritz.com/c/com2011/00/01/32/13292/1/1/0/800923192/gr-grz-_3515840-v5-andritz_code_of_business_conduct_and_ethics_e.pdf (accessed April 12).
- Andritz (2012b), Company Homepage and Description, available at: www.andritz.com/en/index/group.htm (accessed April 13).
- Andritz (2012c), “Ecological sustainability”, available at: www.andritz.com/group/gr-about-us/gr-sustainability/gr-environmental-sustainability.htm (accessed April 13).
- Andritz (2012d), “Social sustainability”, available at: www.andritz.com/group/gr-about-us/gr-sustainability/gr-social-sustainability.htm (accessed April 13).
- Andritz (2012e), “Sustainability has always been an integrated part of Andritz’s corporate policy”, available at: www.andritz.com/group/gr-about-us/gr-sustainability.htm (accessed April 13).
- Andritz (2012f), “World market leadership and profitable growth”, available at: www.andritz.com/en/index/group/gr-about-us/gr-profile-vision-strategy-goals.htm (accessed August 8).
- Aschemann, R., Ahamer, G. and Omann, I. *et al.* (2008), *EIA and SEA – Sustainability Assessment in Practice*, Reports from Environmental Systems Sciences, Issue 2008/09, available at: www-classic.uni-graz.at/vre1www/deposit/USW-IP-UVP&SUP_SS2008_Endbericht.pdf (accessed May 30, 2012).
- Banktrack (2012), “Belo Monte dam project, Brazil”, available at: www.banktrack.org/show/dodgydeals/belo_monte_dam_project#tab_dodgydeals_basics (accessed August 10).
- Bader, L. and Zotter, V. (2012), “Interdisciplinarity: wishful thinking? Experiences at the University of Graz”, *Multicultural Education & Technology Journal*, Vol. 6 No. 3, pp. 118-36.
- BBC (1999), “British protest against Turkish dam”, available at: <http://news.bbc.co.uk/2/hi/europe/383871.stm> (accessed August 21, 2012).
- BBC (2010), “Brazil grants environmental licence for Belo Monte dam”, available at: <http://news.bbc.co.uk/2/hi/8492577.stm> (accessed August 21, 2012).
- Bosshard, P. (2012), “Ilisu dam”, International Rivers, available at: www.internationalrivers.org/campaigns/ilisu-dam (accessed August 21).
- Corner House (2000a), *Leaked Report Reveals Major Problems with Ilisu Resettlement*, An Ilisu Dam Campaign Briefing on the “Ilisu Dam’s Resettlement Action Plan (RAP) – Achieving International Best Practice”, The Ilisu Dam Campaign and The Corner House, first published 6 September 2000, available at: www.thecornerhouse.org.uk/resource/leaked-report-reveals-major-problems-ilisu-resettlement (accessed August 21, 2012).
- Corner House (2000b), *The Ilisu Dam, the World Commission on Dams and Export Credit Reform*, Final Report of a Fact-Finding Mission to the Ilisu Dam Region, Ilisu Dam Campaign; The Kurdish Human Rights Project; The Corner House; World Economy, Ecology and Development; Eye on SACE Campaign and Pacific Environment Research Center, available at: www.thecornerhouse.org.uk/resource/ilisu-dam-world-commission-dams-and-export-credit-reform (accessed August 21, 2012).

- Corner House (2000c), *2000: Balfour Beatty's Annus Horribilis*, Balfour Beatty: Counter-Report 2000, Ilisu Dam Campaign, Oxford, available at: www.thecornerhouse.org.uk/sites/thecornerhouse.org.uk/files/balfour.pdf (accessed August 21, 2012).
- Corner House (2001), *Review of EIAR for the Ilisu Dam and HEPP (HydroElectric Projects)*, The Corner House, Ilisu Dam Campaign, Kurdish Human Rights Project, Friends of the Earth, Berne Declaration, Campaign An Eye on SACE, Pacific Environment, World Economy, Ecology and Development (WEED), available at: www.thecornerhouse.org.uk/resource/review-eiar-ilisu-dam-and-hepp-hydroelectric-projects (accessed August 21, 2012).
- Counter Current (2011), *Dam Construction in Turkey and Its Impact on Economic, Cultural and Social Rights*, Parallel Report in Response to the Initial Report by the Republic of Turkey on the Implementation of the International Covenant on Economic, Social and Cultural Rights, Submission to the UN Committee on Economic, Social and Cultural Rights for its 46th Session, 2-20 May, available at: <http://english.turkiyesumeclesi.net/> (accessed May 29, 2012).
- DKA (2011), "Belomonte – Die Lebensader Xingu darf nicht abgeschnürt werden", available at: www.dka.at/belomonte (accessed May 14, 2012).
- DKA (2012), "Development Cooperation Agency of the Catholic Children's Movement in Austria", available at: www.dka.at/index.php?id=english (accessed August 9).
- Dreikönigsaktion (2011), *Das Staudammprojekt Belo Monte' in Brasilien. Die indigenen Völker am Xingu leisten Widerstand*, Hilfswerkt der katholischen Jungschar, available at: www.dka.at/fileadmin/download/entwicklung/Belo_Monte_Brasilien_Fact_Sheet_1002__1_.pdf (accessed June 6, 2012).
- ECA Watch (2005), *Der Ilisu-Staudamm: Kein Erfolgsprojekt. Zum Hintergrund und aktuellen Stand des größten Staudammprojekts im Südosten der Türkei*, available at: www.eca-watch.at/downloads/Ilisu-Staudamm.pdf or www.stopp-berlusconi.at/fileadmin/at/dokumente/energie/Ilisu/D25_Ilisu_Kein-Erfolgsprojekt.pdf (accessed August 8, 2012).
- ECA Watch (2007), *Ilisu-Staudammprojekt am Tigris: Österreichs schmutzige Hände!*, available at: www.eca-watch.at/downloads/SchmutzigeHaende.pdf
- ECA Watch (2008), *Ilisu schlechter als chinesische Projekte*, Experten belegen: Projekt entspricht nicht internationalem Standard, available at: www.eca-watch.at/downloads/CoE%20Repot140308.pdf
- ECA Watch (2010), *Nomination für den Public Eyes Award 2010*, available at: www.eca-watch.at/downloads/Public_Eye_Nominierung_2010.pdf
- ECA Watch (2012), *Andritz AG: Profit auf Kosten von Menschen und Umwelt*, available at: http://m-h-s.org/ilisu/upload/PDF/2012/Fact_Sheet_Andritz_neu_Februar_2012.pdf (accessed August 10).
- Eichelmann, U. (2010), "Belo Monte=Wasserkraft-Gigantomanie", available at: <http://ulricheichelmann.wordpress.com/> (accessed May 22, 2012).
- Eichelmann, U. (2011), "Profits through destruction – the other annual balance of Andritz", Banktrack, available at: www.banktrack.org/show/news/profits_through_destruction_the_other_annual_balance_of_andritz (accessed April 12, 2012).
- ENS (2009), "European governments pull financing for Turkey's Ilisu Dam", available at: www.ens-newswire.com/ens/jun2009/2009-06-22-02.asp (accessed August 20, 2012).
- GAP (2011), South-eastern Anatolia Project Regional Development Administration, Ministry of Development, Republic of Turkey, available at: www.gap.gov.tr/about-gap/what-is-gap (accessed August 10, 2012).

-
- GfBV (2003), "Bau des Ilisu-Staudammes in der Türkei muss gestoppt werden!", Bolzano/Bozen, available at: www.gfbv.it/2c-stampa/03-1/030327de.html (accessed August 21, 2012).
- GfBV (2010), "Brasilien: ökologische und soziale Folgen durch Belo Monte", available at: <http://gfbvberlin.wordpress.com/2010/08/20/brasilien-okologische-und-soziale-folgen-durch-belo-monte/> (accessed May 21, 2012).
- Global Studies (2012a), "Master curriculum 'Global Studies' – Berufsbild", Graz University, available at: www.uni-graz.at/vre1www/vre1www-ma/vre1www-berufsbild (accessed April 12).
- Global Studies (2012b), "Master curriculum 'Global Studies' – Schwerpunkte", Graz University, available at: www.uni-graz.at/vre1www/vre1www-ma/vre1www-ma-schwerpunkte.htm (accessed April 12).
- Global 2000 (2012), Articles on Ilisu, available at: www.global2000.at/site/de/search/Ilisu
- Graz University (2012), *Zitate zu Gemeinwohl*, Faculty for Theology, available at: www-theol.uni-graz.at/cms/dokumente/10014006/71367244/zitate_zu_gemeinwohl.pdf
- Greenpeace (2012), *Andritz AG: Profit auf Kosten von Menschen und Umwelt*, Greenpeace, Amsterdam.
- Hasankeyf Matters (2012), "Hasankeyf: past, present, future", Blog and Resources, available at: www.hasankeyfmatters.com/p/resources.html (accessed August 8).
- Hildyard, N. *et al.* (2000), "If the river were a pen . . .", *The Ilisu Dam, the World Commission on Dams and Export Credit Reform*, The Final Report of a Fact-Finding Mission to the Ilisu Dam Region, 9-16 October.
- Huffington Post (2012), "Bianca Jagger: the Belo Monte dam: an environmental crime", available at: www.huffingtonpost.com/bianca-jagger/the-belo-monte-dam-an-env_b_1614057.html (accessed August 8).
- Intercontinentalcry (2011), "Harmful impacts of the Belo Monte dam on the Amazon's Xingu River", available at: <http://intercontinentalcry.org/harmful-impacts-of-the-belo-monte-dam-on-the-amazons-xingu-river/> (accessed August 8, 2012).
- International Rivers (2012), *Belo Monte Fact Sheet*, available at: www.internationalrivers.org/files/attached-files/belo_monte_factsheet_may2012.pdf (accessed August 10).
- Jungschar (2011), *Annual Report 2011*, available at: www.jungschar.at/fileadmin/download/startseite/jahresbericht_jungschar_dka_2011_web.pdf (accessed August 8, 2012).
- Kandler, J. (2011), *Megastaudammprojekt Belo Monte*, available at: www.vamos-actnow.eu/images/doku/201101_klimabuendnis_zeitung_belomonte.pdf (accessed August 10, 2012).
- KHRP (1999), *The Ilisu Dam: A Human Rights Disaster in the Making*, Kurdish Human Rights Project (KHRP), available at: www.thecornerhouse.org.uk/resource/ilisu-dam-human-rights-disaster-making (accessed August 20, 2012).
- KHRP (2002), *Downstream Impacts of Turkish Dam Construction on Syria and Iraq: Joint Report of Fact-Finding Mission to Syria and Iraq*, The Corner House, The Ilisu Dam Campaign and Kurdish Human Rights Project (KHRP), available at: www.thecornerhouse.org.uk/sites/thecornerhouse.org.uk/files/IraqSyri.pdf (accessed August 20, 2012).
- KHRP (2007), *The Ilisu Dam: Downstream Water Impacts and Iraq*, Report of Fact Finding Mission to Iraq, 29 March, The Corner House and Kurdish Human Rights Project (KHRP), available at: www.thecornerhouse.org.uk/sites/thecornerhouse.org.uk/files/IlisuDownstream.pdf
- Klimabündnis (2012), "Staudamm Belo Monte bedroht rund 5.000 Indigene am Xingu Fluss", available at: www.klimabuendnis.at/start.asp?ID=231825&b2=771 (accessed May 12).

- Kräutler, E. (2012), "Xingu-Vivo-Aktivist*innen wird das Leben zur Hölle gemacht", *Plattform Belo Monte*, Bishop Erwin Kräutler, Altamira, available at: <http://plattformbelomonte.blogspot.co.at/2012/04/bischof-krautler-belo-monte-aktivisten.html> (accessed April 12).
- Latina Press (2012), "Rio+20: Greenpeace gegen Andritz-Beteiligung an Belo Monte-Staudamm", available at: <http://latina-press.com/news/127135-rio20-greenpeace-gegen-andritz-beteiligung-an-belo-monte-staudamm/> (accessed August 8).
- Maisonet (2010) in Maisonet-Guzman, O.E. (Ed.), *Amazon Battle: Dams Conflicts*, Fall 2010, ICE Case Studies, Number 230, December, available at: www1.american.edu/ted/ice/amazondams.html (accessed August 20, 2012).
- OeKB (2012), "Chronologie zum Projekt Ilisu", available at: www.oekb.at/de/exportservice/projekte/umweltkategorie-a-b/ilisu/seiten/default.aspx (accessed August 20).
- Ökoprofit (2012), "Andritz is participant in Ecoprofit", available at: www.oekostadt.graz.at/cms/beitrag/10117056/2333845/ (accessed August 10).
- Ökostadt Graz (2012), "Die ÖKOPROFIT Win-Win-Idee", available at: www.oekostadt.graz.at/cms/ziel/1939202/DE/ (accessed May 21).
- Presse (2010), "Ilisu: Andritz liefert ohne Staatsgarantie", available at: http://diepresse.com/home/wirtschaft/eastconomist/573957/Ilisu_Andritz-liefert-ohne-Staatsgarantie (accessed August 9, 2012).
- Presse (2011), "Mega-Staudamm im Amazonas: Gericht ordnet Baustopp an", available at: <http://diepresse.com/home/panorama/klimawandel/696954/Mega-Staudamm-Belo-Monte-Gericht-ordnet-Baustopp-an> (accessed May 14, 2012).
- PWA (2001), *A Review of the Hydrologic and Geomorphic Impacts of the Proposed Ilisu Dam*, Philipp Williams and Associates, Corte Madera, CA, available at: www.thecornerhouse.org.uk/sites/thecornerhouse.org.uk/files/ilisueia.pdf
- respACT (2010), Austrian Business Council for Sustainable Development, available at: <http://respact.at/site/plattform/wirueberuns/info/article/5671.html?SWS=75e7da365eba0b053e57f7cd9ac94821>, English version at: <http://respact.at/site/english> (accessed April 12, 2012).
- RiverNet (2012), "The Ilisu dam project", available at: www.rivernet.org/turquie/ilisu.htm (accessed August 8).
- Ronayne, M. (2005), *The Cultural and Environmental Impact of Large Dams in Southeast Turkey*, Fact-Finding Mission Report, Kurdish Human Rights Project, London, available at: www.nuigalway.ie/archaeology/documents/ronayne_turkey_dams.pdf (accessed August 22, 2012).
- Schwentner, J. (2012), "zu Ilisu-Projekt: CSR von Andritz allmählich reiner PR-Gag", Grüne Österreich, available at: www.gruene.at/aussenpolitik/artikel/lesen/62890/ (accessed April 13).
- Setton, D., Drillisch, H., Bozyigit, F. and Neyer, J. (2005), *Der Ilisu-Staudamm: Kein Erfolgsprojekt. Zum Hintergrund und aktuellen Stand des größten Staudammprojekts im Südosten der Türkei*, WEED – Weltwirtschaft, Ökologie und Entwicklung, Berlin, available at: www.eca-watch.at/downloads/Ilisu-Staudamm.pdf (accessed April 13, 2012).
- Standard (2010a), "Andritz hält beim umstrittenen Dammprojekt in der Türkei als einziger europäischer Konzern die Stellung", available at: <http://derstandard.at/1271376779778/Andritz-bleibt-dabei-Ilisu-Staudamm-Bauriesen-springen-ab> (accessed August 8, 2012).
- Standard (2010b), Aussendung von Greenpeace, GLOBAL 2000 und ECA Watch (accessed March 26).

-
- Standard (2011), "Baustelle von Belo-Monte-Kraftwerk besetzt", available at: <http://derstandard.at/1319181423193/Brasilien-Baustelle-von-Belo-Monte-Kraftwerk> (accessed August 8, 2012).
- Stop Ilisu (2011), "European involvement in the Ilisu project", available at: http://m-h-s.org/Ilisu/front_content.php?client=5&changelang=8&parent=&subid=&idcat=124 (accessed August 8, 2012).
- Südwind (2011), "Dolchstoß ins Herz von Amazonien", *Südwind Magazin für Internationale Politik, Kultur und Entwicklung*, April, available at: www.suedwind-magazin.at/start.asp?ID=243863&rubrik=2&ausg=201104
- Südwind (2012), "Andritz AG/Bilanz", *Südwind Magazin für Internationale Politik, Kultur und Entwicklung*, April, available at: www.suedwind-magazin.at/start.asp?ID=248594&rubrik=4&ausg=201204
- USW (2012), *Reports on Interdisciplinary Practicals in Environmental Systems Science at Graz University*, available at: www.uni-graz.at/usw1www/usw1www_publikationen/usw1www_berichte.htm (accessed May 30).
- WBCSD (2009), *The Green Race is on: The New Business Agenda*, WBCSD Annual Review, World Business Council for Sustainable Development, Geneva, available at: www.wbcsd.org/ (accessed April 13, 2012).
- WEED (2012), *Weltwirtschaft, Ökologie und Entwicklung*, World Economy, Ecology and Development, available at: www.weed-online.org/themen/hermes/17905.html (accessed April 13).
- Westerhof, J. (2012), "Presseaussendung zur Andritz-Bilanz: Die andere Seite der Medaille", Stop Ilisu, available at: http://m-h-s.org/Ilisu/front_content.php?idcat=143&idart=764 (accessed April 12).
- Wikipedia (2012), Ilisu-Staudamm, available at: <http://de.wikipedia.org/wiki/II%C4%B1su-Staudamm> (accessed August 10).
- Wikipedia.org (2012), Belo Monte dam, available at: http://en.wikipedia.org/wiki/Belo_Monte_Dam (accessed August 10).
- Wirtschaftsblatt (2011), "Brasilien: Baustopp für Belo Monte von Gericht aufgehoben", available at: www.wirtschaftsblatt.at/home/international/unternehmen/brasilien-baustopp-fuer-belo-monte-von-gericht-aufgehoben-500639/index.do (accessed June 6, 2012).
- WN (2012), "Bilirkişi Hasankeyf'te", available at: http://article.wn.com/view/2011/12/02/bilirki_i_hasankeyfte/ (accessed August 8).
- Wordpress (2012), "Xingu Vivo – Ativistas ocupam canteiro de Belo Monte e exigem imediata paralisação das obras", available at: <https://pontodepauta.wordpress.com/2012/06/15/ativistas-ocupam-canteiro-de-obras-de-belo-monte/> (accessed August 8).
- World Commission on Dams (2000), *Dams and Development: A New Framework for Decision-Making*, Sterling: Earthscan, London.
- WWF Brazil (2012), *Sustainable Power Sector Vision 2020*, English Summary, available at: www.climatesolver.org/source.php/1252339/brazil_pswstudy_english_summary.pdf (accessed May 24).
- Yalçın, E. and Tiğrek, Ş. (2010), *Investigation of Alternative Solutions to Ilisu Dam And HEPP*, Civil Engineering Department, Middle East Technical University, available at: <http://m-h-s.org/Ilisu/upload/PDF/2010/Alternativprojekt.pdf>
- Youtube (2012), "Defending the Rivers of the Amazon, with Sigourney Weaver", available at: www.youtube.com/watch?v=Melq7VA7FjY (accessed August 21).
- Zeit (2012), "Hinweise auf Unterstützung Assads durch PKK", *Die ZEIT*, available at: www.zeit.de/politik/ausland/2012-04/syrien-pkk-tuerkei (accessed April 12).

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