

Beyond *Bt* and Butterflies: The Media and its Influence on Public Perspectives of Biotechnology

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May 2008

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“The Media” has become an enormously influential, cross-boundary and cross-platform network of information and opinion. It is constantly shaping the way the public perceives and processes new information. As Judge Learned Hand once said, “The hand that rules the press, the radio, the screen and the far-spread magazine, rules the country.” And with such power comes the ability to sway public opinion simply by (a) the selection of information and opinions to be disseminated and (b) the manner in which these are presented. Public perceptions and acceptance of biotechnology have been greatly influenced by the media, and the media’s coverage of biotechnology topics has been, in turn, most influenced by the information provided through scientific journals, industry and government press releases, and contributions from public relations branches of non-governmental organizations. The media has shaped the public’s attitudes towards biotechnology in the West, and it is also playing a crucial role in shaping public perceptions of biotechnology in the developing world.

This paper argues that in the developing world (especially in the case of Africa), where much of the public has yet to form set opinions about biotechnology, the media has the responsibility of presenting biotechnology in a context relevant to the locale, rather than transplanting the coverage and debates over biotechnology from Europe and North America. To present this argument, a comprehensive literature review introduces current scholarship on the media and public perceptions in biotechnology, followed by an in-

depth analysis of the controversy over *Bt*-corn and the Monarch butterfly—a case that illustrates just how influential a role the media has played in shaping the biotechnology debate in the USA. Finally, suggestions are made about how industry and the media may approach publicity and coverage of biotechnology issues in Africa to avoid problems that have been encountered in the past and to promote independent rational analysis of the risks and benefits of biotechnology, rather than caving to pressure from Western partisans on either side of the biotechnology debate.

Literature Review: The Media and Public Perception of Biotechnology

The term “biotechnology” encompasses all technology based upon biology, however it is most often associated with the genetic engineering of agricultural and pharmaceutical products. It is currently a hotly debated topic, due to environmental, public health and ethical concerns. Nisbet and Lewenstein state that biological technology has been used by humans for millennia, however controversy has only arisen over the “new biotechnology,” which emerged in the 1970’s with the direct genetic manipulation of organisms (Nisbet and Lewenstein, 2002).

The media plays a crucial role in shaping public perceptions of biotechnology. Through the 1980’s and 1990’s, the level of public awareness of agrobiotechnology issues clearly corresponded to the amount of media coverage the topic received (Marks and Kalaitzandonakes, 2001; Marks *et al.*, 2003). Nisbet and Lewenstein state that the media is the “principle arena” where issues of biotechnology policy are presented to interest groups, policy-makers and the public, and holds significant power in shaping biotechnology debates. This power emanates from the ability to present issues to a wide

audience within a chosen frame, and it has been used to both direct the attention of the public toward particular issues in biotechnology and to decide how these issues are regarded and symbolized (Nisbet and Lewenstein, 2002; Ten Eyck and Williment, 2004). As empirical support for this theory, a recent study by Gunther and Liebhart showcases found that people were much more strongly influenced toward a bias when the exact same essay about a biotechnology issue was presented to them as a newspaper article than when it was presented as a college student's essay (Gunther and Liebhart, 2007), again showing the media's unique power in the biotechnology debate.

Many in the media profess that it is their goal and responsibility to provide unbiased news and reporting, yet having unbiased reporters may not be enough to give the public neutral information. Wingenback and Rutherford stress that when reporting on biotechnology issues, journalists need not only be fair and unbiased, but must also be careful to "consider the trustworthiness, bias, and fairness of information sources used to gather and form the news" (Wingenback and Rutherford, 2005). These sources range from university scientists and researchers, to industry generated press-releases, to the statements of NGO's and activist groups, and it is the responsibility of good reporters to listen to all of these sources, but then seriously assess their bias and validity. In addition to scrutinizing their sources, media professionals need also carefully consider the ways in which they link topics, and how this may influence the public's opinions. Marks and Kalaitzandonakes point out that issues to which the media links biotechnology stories have a major impact on public perceptions. Their study found that media in the United Kingdom repeatedly linked the risks of genetically modified foods to "catastrophic and memorable food safety related events," such as mad cow disease and *E. coli*

contamination. They also showed that reporting about benefits of GM foods decreased between 1991 and 2001, with a switch to emphasis of risks. On the other hand, United States media coverage had been “more positive” and concentrated more on the benefits of GM foods (Marks and Kalaitzandonakes, 2001). Likewise, Nesbit and Lewenstein’s study showed that two major US publications largely covered benefits of biotechnology over risks (Nesbit and Lewenstein, 2002). Ten Eyck and Williment analyzed *New York Times* coverage of food technology from 1890 to 2000, concentrating on issues of pasteurization, food irradiation and biotechnology. Though these three technologies arose and were covered in the media at different points in time, the patterns of their coverage and framing were very similar. When the technologies were emergent new ideas, coverage was generally hopeful and concentrated on potential benefits for society from health benefits to famine reduction: associations derived from the framing of research goals by the industry creating the products. Yet ten to fifteen years into coverage on each of the topics, the concentration changed to characteristics such as effect on taste and quality of food, and skepticism is introduced. Beyond fifteen years, the debates diverged more and in the case of biotechnology, they focused increasingly on economics. The study showcases parallel trends in food reporting through time, and though reporting practices have changed, the authors argue that “societal values with regards to food seem to have changed little, and these are the building blocks on which reporting in this area is based” (Ten Eyck and Williment, 2004).

Moving on from studies of specific periodicals and looking broadly across the media, there is a clear trend of concentration on these headlining stories, “hot topics” and current affairs; the day-to-day progress of biotechnology research and implementation is

only lightly covered. Then, when controversy arises over a certain biotechnology case, media coverage spikes tremendously (Nesbit and Lewenstein, 2002; Marks *et al.*, 2003). Brossard and Shanahan describe this as an issue cycle, where specific “triggering events” spur in-depth media coverage, which eventually slows back to the normal state of light coverage until another major event occurs. “Triggering events moved coverage [of biotechnology] out of the arena of ‘benign science’ and into controversy over moral, political or social issues... Coverage during the down parts of the cycle tends to be more scientifically focused” (Brossard and Shanahan, 2007). Nesbit and Lewenstein’s in-depth review of biotechnology coverage in the *New York Times* and *Newsweek* confirmed this cycle, as they found that coverage was quite temporally uneven:

“Biotechnology coverage has been heavily event-centered or episodic within years, peaking or plummeting across week or month in correspondence to the latest major article appearing in *Science* or *Nature*, the announcements of politicians or regulatory bodies, a major announcement at a scientific meeting, or the occasional high-profile incident” (Nesbit and Lewenstein, 2002).

Due to this issue cycle, the general public is mainly exposed to the controversial “hot topics” in biotechnology, and is more likely to encounter political, social, environmental and moral issues and arguments pertaining to biotechnology than they are to learn about the research being done and progress being made.

The media’s biotechnology issue cycle poses a particular conundrum for researchers and the biotechnology industry: how can they make their day-to-day work and progress seem newsworthy enough to publicize it successfully and inform the public in hopes of gaining its trust? One must first examine how individuals perceive technology. According to Dr. Philipp Aerni of the Agri-food & Agri-environmental Economics Group, individuals form their views about the benefits and risks of any new

technology through personal experience with the technology, the information provided to them by their selected sources, and the values and interests that they feel are shared with perceived stakeholders (industry, NGOs, researchers). If we apply this theory to the specific case of biotechnology, we see that people can rarely rely on personal experience with the risks of biotechnology in any tangible measure, as they are largely unknown or thought to be long-term. As for obtaining information, Aerni argues that most people “simply don’t have the time” to study the complex science behind biotechnology, so they turn instead to the general media, which provides “dramatic storytelling (narratives) containing victims and perpetrators, heroes and cowards, innocent and guilty actors” (Aerni, 2005a). This transformation of dynamic, constantly revised scientific and technological advance to simplistic and stereotyped narrative leads people to form opinions about the actors rather than the science involved. So the crucial factor for acceptance of biotechnology becomes trust in the organizations and institutions providing information.

Scientists and science educators once widely believed that the non-scientific public simply lacked the knowledge to form rational opinions of scientific matters, and that if people were sufficiently educated about the science behind new advances and technologies, then they would more readily accept them (or more rationally reject them). However, time and again this theory has not held true, especially in the cases of highly controversial topics such as those involving new technologies with broad-ranging public implications. Many studies have shown that knowledge and understanding of new technologies often has little correlation with public acceptance of these technologies,

whereas broader trust in science, government and institutions plays a much larger role in determining whether or not there will be acceptance (Brossard and Shanahan, 2007).

Trust is important in all of the relationships involved, and one must look not only at the public's trust in science, industry and media, but also examine who the industry trusts, who scientists trust, and of course, what sources journalists trust (as it is they who will determine which arguments get heard). A study by Wingenback and Rutherford showed that journalists themselves had a large degree of trust in scientists:

“Journalists believed university scientists/researchers and newspapers were trustworthy, unbiased, and fair, while activist groups were untrustworthy, completely biased, and unfair in communicating agricultural biotechnology issues. They were most opposed to public opinion outweighing scientists' opinions when making decisions about scientific research” (Wingenback and Rutherford, 2005).

However, this trust did not appear to be shared both ways. Although their studies showed that journalists had a high degree of trust in statements provided by scientists and university researchers, the study also points to a 2000 study by the National Science Foundation, where only 11% of scientists stated that they had “a great deal of confidence” in the press (National Science Foundation, 2000: as cited in Wingenback and Rutherford, 2005). Another interesting finding was that the journalists surveyed were most opposed to the idea that in scientific decision-making, public opinion may outweigh scientists' opinions. Though it is the professed goal of the media to inform the public, they did not seem, in turn, to trust the public's ability to make crucial decisions. This opinion must be kept in mind when considering the tack that media professionals take when they are reporting on scientific issues.

As for the biotechnology industry, it must go beyond the goal of simply dispersing information to inform their public by determining the values and interests of

their customers, then figuring out how to match these and gain the people's trust. Dan Eramian, Vice President of Communications of BIO (the Biotechnology Industry Organization), argues that often no publicity is better than ill-planned efforts at public relations:

“Sometimes it is not the enemy that causes the most damage – sometimes it is our own disconnected, uncoordinated, ill-planned efforts that hurt us the most. We sometimes fire, aim, and get ready when we disseminate our message rather than taking the time to find out who our audiences are or what really makes them tick” (Eramian, 2002).

As Eramian highlights in this quote, the first step to gaining trust is to understand one's target audience and discovering their priorities, wishes and worries.

Often, the goal of objectively informing the public over controversial issues is complicated by the trend of “homogamic communication,” or the tendency of people to choose communication with and from sources (both individuals and media) that hold the same basic opinions as their own, since they seek to have their personal beliefs confirmed rather than questioned (Wagner and Kronberger, 2001). Gunther and Liebhart note that debates such as those around biotechnology issues often trigger a response called the “spiral of silence,” whereby individuals withdraw from discussion if they feel that others involved do not share their opinions and perspective. It is therefore difficult for parties on all sides of biotechnology debates to address an audience that is already partisan in its view of the issues. It may be necessary for biotechnology communicators to find a way of aligning themselves with their audience's beliefs and ideals, however they must be careful to remain ethically truthful of their own goals and motivations.

The Case of the Monarch Butterfly

In 1999, the highly respected peer-reviewed science journal, *Nature* published a one-page scientific correspondence from Professor John Losey at Cornell University titled “Transgenic pollen harms monarch larvae,” which found that monarch butterfly larvae had decreased performance and survival when fed milkweed dusted with pollen from corn genetically engineered to produce the pesticidal *Bt*-toxin (Losey *et al.*, 1999). The media hailstorm and NGO-driven public outcry that followed this single article became one of the most well known (and as we will see, one of the most overblown) controversies in the history of biotechnology. By the time researchers, government agencies, and the biotechnology industry could respond with science-supported counter-arguments and rebuttals, their credibility and trustworthiness in the eyes of the monarch-loving public had already been irrevocably damaged. An in-depth analysis of how these events played out can provide valuable insight for media approaches in biotechnology.

Genetically modified corn engineered to produce the *Bt* toxin, a “biopesticide” derived from the bacteria *Bacillus thuringiensis*, became the first nationally registered genetically engineered crop when the Environmental Protection Agency (EPA) approved it for marketing in 1995 (but only provided 5-year registrations so they could review experiences of growing the crop before further approval). The *Bt*-toxin is very effective against the European corn-borer, a pest which farmers had been hesitant to combat in the past because the difficulty of timing efforts and the lack of effective pesticides (Pew Initiative of Food and Biotechnology, 2002). The *Bt*-toxin was already in use as a biopesticide spray approved for organic farming (Gatehouse *et al.*, 2002). Many farmers across the country quickly switched to the genetically modified crop because of improved

yield, profitability and effectiveness, which outweighed the higher seed price. The EPA had originally estimated that by 2000, around 5% of corn grown in the USA would be genetically modified to produce *Bt*-toxin, but the crop was adopted more quickly than expected and by that year it was actually at 25% (Pew Initiative of Food and Biotechnology, 2002).

Before its approval of the crop, the EPA had assessed the risk of *Bt*-corn for humans and other organisms, including birds, and number of aquatic and terrestrial invertebrate species. They did not specifically assess, however, the effects on monarch butterfly larvae, though they did note that as lacewings, monarchs were likely to be affected by the *Bt*. Yet this concern was dismissed as it was determined that the butterflies were unlikely to be exposed to *Bt*-corn and were much more likely to be affected by *Bt* spraying that was already taking place in organic farming (Pew Initiative of Food and Biotechnology, 2002).

From 1998-1999, Dr. John Losey of Cornell university undertook a study (under a grant from the U.S. Department of Agriculture) to see whether weeds in these fields might be alternative hosts for the corn borer, and while performing this research he saw that milkweed was growing in and around many of the fields. Milkweed is the only source of nutrition for monarch butterfly larvae, so Losey began to wonder whether the pollen from *Bt*-corn, which could land on the milkweed, would have an effect on the Monarch (Pew Initiative of Food and Biotechnology, 2002). He quickly performed an experiment to examine these potential effects. Losey placed monarch butterfly larvae on leaves that had been dusted with an amount of *Bt*-corn pollen that visually replicated that observed on milkweed plants nearby cornfields. The larvae on leaves dusted with *Bt*-

corn pollen ate less, grew more slowly, and died more frequently than those placed on leaves that had been dusted with pollen from a strain of non-genetically-modified corn (Losey, 1999). Losey first submitted his study to *Science* but it was rejected (Werhane *et al.*, 1999). He then turned to *Nature*, and managed to publish a single-page article about this study in the magazine's commentary section (Pew Initiative of Food and Biotechnology, 2002). Thanks to early tips from *Nature* magazine and intense pressure and attention from anti-GMO activist groups and NGO's, the lay press immediately picked up on the story. These NGO's and environmental interests groups touted the findings as evidence of the harms and hazards of genetically modified crops (Hodgson, 1999; Pew Initiative of Food and Biotechnology, 2002).

The *New York Times* ran the story on its front page the same day as the issue of *Nature* came out, and included in its article a statement from Dr. Margaret Mellon of the Union of Concerned Scientists, who pronounced that Losey's study was "20 million acres of *Bt* corn too late" (as quoted in Werhane *et al.*, 1999). Greenpeace held a demonstration at the U.S. Capitol building and acted out the death of monarch butterflies at the hands of "killer GM corn," and newspapers around the country ran sensational headlines, such as the San Francisco Chronicle's article titled "Gene spliced Corn Imperils Butterflies" (Pew Initiative of Food and Biotechnology, 2002). According to Nesbit and Lewenstein, "Environmental groups that had been on the periphery of the agricultural biotechnology debate were now lured to the topic," and "the media for the first time were able to report on a tangible possible threat" (Nesbit and Lewenstein, 2002). Although these stories only indicated that there *might* be a risk to the monarch, the intense media coverage and heavy campaigning by anti-GMO groups successfully

spurred the public into an outcry, and people across the country made up their minds to oppose agricultural biotechnology. Dr. Losey had known there would be interest in his study due to the renown and status of the monarch butterfly, but states that he was astounded by this “media firestorm” that it brought on. He says, “I don’t think I’d ever seen that level of interest in any paper, let alone one I had published” (as quoted in Pew Initiative of Food and Biotechnology, 2002).

While anti-GMO groups latched on to the study as proof of the perils of biotechnology, much of the scientific community came out with strong criticism of Losey’s study, his methods and the conclusions that were so hastily being drawn from his findings. The study’s results failed to impress many scientists, who were quick to point out the shortcomings in experimental design: Losey had not quantified the pollen dosage on the leaves, he had chosen poor controls (from a different field corn variety than that which had been genetically modified), and he had placed larvae in “no-choice” trials where only milkweed coated in *Bt*-corn pollen was available (Hodgson, 1999; Gatehouse *et al.*, 2002; Pew Initiative of Food and Biotechnology, 2002). Gatehouse *et al.* note that these no-choice tests should have only served to provide baseline data for subsequent studies simulating more realistic conditions. They should *not* have been used to jump to the conclusion that *Bt*-corn is a threat to the survival of monarch butterflies (Gatehouse *et al.*, 2002). Another important consideration is the basic toxicity equation, which states that risk equals hazard times exposure, therefore if exposure is negligible, then hazard is of little concern. Losey’s critics questioned whether monarch butterfly larvae would be significantly exposed to the *Bt*-toxin in the field, and also, whether they would choose to eat leaves coated in pollen.

In response to the attention garnered by Losey's study, the government quickly pulled together researchers to conduct further studies to analyze *Bt*-corn's effects on monarch butterflies more thoroughly. Meanwhile, the EPA took a precautionary approach, requiring that farmers plant non-*Bt corn* over at least 20% of their fields (Werhane *et al.*, 1999). These subsequent studies returned results suggesting that actual risks to the butterflies might be minimal. Hellmich *et al.* found that monarch larvae were only sensitive to two of the pesticidal Cry proteins produced by *Bt.*, meaning that lines of *Bt*-corn that did not express those two specific Cry proteins would not pose a threat to monarch larvae. Furthermore, the protein most harmful to the larvae was produced by less than 2% of the corn planted, and as there had been no application for re-registration of that strain with the EPA, it would not pose a threat for long into the future. Other strains did produce Cry proteins toxic to monarchs, but the proteins were not active in the pollen (the only part of the *Bt*-maize that monarch larvae are likely to come in contact with) (Hellmich *et al.*, 2001). Activist groups had used Losey's study to attack *Bt*-maize as a crop, yet these studies show that only certain lines are even potentially threatening to monarch butterflies. Such nuances often do not receive coverage in the lay media, and their admission can help to over-blow concerns. Perhaps one of the most enlightening statistics is that over a period where the planting of *Bt*-maize increased by over 40%, the monarch population also increased by an estimated 30%, showing that there were at least no immediate, large-scale threats to these species' survival. Drawing from these studies and numbers a review by Gatehouse *et al.*, which examined both Losey's study and subsequent research, concluded: "In contrast to the two early reports, the evidence to date

leads to a conclusion that transgenic *Bt*-expressing maize plants will not have a detrimental impact on the monarch butterfly” (Gatehouse *et al.*, 2002).

Yet despite such strong findings contrary to the initial conclusions drawn from Losey’s research, these rebuttals did not receive sufficient media coverage to drive the image of monarchs killed by *Bt* corn out of the public psyche. Marks and Kalaitzandonakes’ study of biotechnology media coverage did find that three main US papers (USA Today, The Washington Post and the Wall Street Journal) reported on the follow-up studies to Losey’s original findings (Marks and Kalaitzandonakes, 2001), though it seems that this coverage was given much lower priority than that of Losey’s the initial study.

Referring back to the previously discussed concept of an “issue-cycle” in the media, this debate over *Bt*-corn and the monarch butterfly was clearly a triggering event, which drove a massive increase in media coverage of biotechnology. Marks *et al.* (2003) analyzed media content on biotechnology to study how landmark events were reported in the UK and USA from 1990 to 2001. They found that coverage of agrobiotechnology spiked significantly in both countries during 1999 (the year Losey’s findings were published), but then had returned to near previous levels by the end of 2001 (Marks *et al.*, 2003), which corresponds with the time when findings from more in-depth studies that showed the corn was of little threat to the monarchs were coming out.

What can we learn from the case of the monarch butterfly? The media has a mighty impact on public perceptions of biotechnology, as it controls what information the public receives about biotechnology issues, and it also determines how these issues will be framed. It is important to note that novel findings in new areas seem to be considered

more newsworthy than findings about already debated subjects, no matter which studies were more scientifically rigorous. The monarch butterfly case also shows just how strong an influence NGOs and activist groups can have on shaping media coverage. If the biotechnology industry is to avoid this sort of extremely detrimental publicity in the future it must seriously reconsider the way it handles the media and find effective methods of publicizing strong rebuttals, so as to have them heard and understood by a wide audience. Likewise, if media professionals and organizations are to provide unbiased journalism they must consider more carefully the validity of their sources and those sources' claims, and also consider how the attention they pay to certain issues sways public perception.

Media for Biotechnology: New Approaches for the Developing World

A survey conducted by Aerni, published in 2005, showed that in the Philippines, Mexico and South Africa, the general attitude towards agricultural biotechnology was “predominantly pragmatic,” an interesting contrast to predisposed “genophobic” European NGO view and “genophilic” American industry view (Aerni, 2005b). A major hypothesis about public resistance to biotech is the “refusal of consumers to accept any risk in the face of little perceived direct benefit” (Marks and Kalaitzandonakes, 2001). This highlights one of the keys to successfully publicizing biotechnology in the developing world: stressing the benefits. Rather than conforming to a view that has been generated by the mass media, many people in developing countries appear to be withholding judgment on biotechnology until they can see how it will hurt or benefit

them, and now is the time for the biotechnology industry to make a strong publicity push to profess the benefits of what it can provide.

So far, there has been little media attention to biotechnology in Africa (Aerni, 2005b; Mumba, 2007). Beginning now, the media in developing countries has the chance to define its own role in the coming debates over biotechnology. In addition to being a vehicle for educating and informing the public regarding the science behind new technologies such as biotechnology, the media should also be a forum for discussion and debate. As Marks and Kalaitzandonakes point out, “Ideally, the media plays the role of arbiter, facilitating communication among various societal stakeholders and providing counter viewpoints from different sides of a debate” (Marks and Kalaitzandonakes, 2001). This has certainly not happened broadly with regard to biotechnology, where strong media coverage of major controversies (like that of *Bt*-corn and the monarch butterfly) but light coverage of subsequent findings and rebuttals has significantly shaped public opinion towards biotechnology. Unbiased reporting is not enough: the process of story selection needs to be seriously rethought. As Cohen states in his 1963 book *The Press and Foreign Policy*, the media “may not be successful... in telling people what to think, but it is stunningly successful in telling people what to think about” (quoted in Marks and Kalaitzandonakes, 2001).

According to Nisbet and Lewenstein, the media’s influence on policy is strongest early on, as media coverage helps define which issues will be concentrated on in the policy-making process (Nisbet and Lewenstein, 2002). This means that now, as the biotechnology industry slowly begins to develop in Africa, the media has an extremely important role to play in shaping the way that policy-makers will respond. Yet if this is

to be done, many changes must be made in the way that the media currently addresses the topic.

In Africa, public debates over biotechnology that occur in the media generally only concern an educated upper-class audience, rather than rural poor who are most likely to benefit significantly from agricultural biotechnology. Mumba notes that when debate raged in Southern Africa over whether to accept genetically modified crops from the USA as food aid, there was an “absence of the voices of the most affected people in rural areas,” and that the debate remained mainly within government circles, among wealthy bureaucrats and ministers. Mumba studied three *Zambian* leading newspapers and found that up until then there had been very little coverage of biotechnology in them, and the coverage had been focused on major events rather than general education about biotechnology. Concerning the debate on GM food aid, Mumba noted that articles in favor of GM foods often did not get published and that proponents of GMOs were sometimes denied airtime on national radio and television. He also found that none of the newspaper articles written had interviewed farmers (Mumba, 2007). It seems that in very rural areas, citizens of underdeveloped countries are not only unlikely to have access to mass media, but also unlikely to receive media attention. Mumba goes on to conclude that “the media are partially to blame” for the outcome where the genetically modified crops were not accepted for food aid though they were clearly needed (Mumba, 2007).

To avoid such catastrophes in the future, what tack must the industry take when publicizing biotechnology in Africa? Clearly trust must be developed, and I believe that this can only happen once the players involved listen to the needs and the wants of the people on the ground: the local farmers and traders, and those who stand to gain or lose

from the introduction of biotechnology. Establishing a discourse between those who develop and promote technologies and those who receive them is so clearly necessary, and yet it is something where the biotechnology industry has failed (or been blocked) again and again. And so it comes down to public relations. The biotechnology industry must engage the local media and develop a strong relationship ship to provide facts and promote publicity of general stories about the science and the benefits of biotechnology, emphasizing steady development and implementation of products and processes rather than only reaching the limelight during a big bang or a big bust. They must keep in mind that the issues debated in the West are not necessarily the most pertinent ones elsewhere, also so it all comes down to context.

Context is crucial, and for the media in Africa and the rest of the developing world, the responsibility will be to analyze and present biotechnology issues within a context that is locally relevant and speaks to issues, both social and environmental, within the countries at hand. Developing countries should not be the “new battlefield” for Europe and North America to continue waging their moral wars over biotechnology. And likewise, co-opting the arguments raging in the West to present to a developing world audience, which faces both different risks and different potential benefits from biotechnology, would be counter-productive and unfair to the local public. What is needed is for local journalists, publicists, policy-makers and activists to be educated about the science behind biotechnology and allowed to start up debate on their own terms... in their nations’ own contexts.

The public needs to learn about and understand how new technologies stand to affect them, not to hear the moral arguments raised on both sides of a debate by far

removed parties in the West, who each claim to be fighting in the interest poorer nations. Just as the Monarch Butterfly was exploited as a symbol of innocence and righteousness by anti-biotechnology groups, and its case has been used by biotechnology supporters to symbolize the irrationality of the activists, Africa is becoming a new emblem in the arguments from both sides of the debate. Biotechnology is painted by some as the miracle cure for famine and hunger and by as others as a stealthy maneuver by globalized industry to exploit the world's poorest. Yet if we view things rationally, it becomes clear that biotechnology is neither a plight nor a salvation: it is a technology and a tool, and it must be portrayed as such. This will allow people in the developing world to form their own opinions and hopefully better empower them to take a hand in deciding their own futures.

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