Sustainable Development, the Press and Policy: A Q Study of Brazilian Policy Makers

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ABSTRACT: A Q study asked 54 Brazilian scientists, administrators and journalists to evaluate sustainable development definitions and concepts, the role of national, local and international institutions in the Amazon's development, specific public policies for the Amazon region and the role of the news media. Four factors emerged and were labeled Locally Oriented Idealists, Internationally Oriented Pragmatists, Regional Architects and Conservative. The findings suggest that respondents place the economic welfare of Amazonia's residents above all other considerations. Cultural stability and the environment are seen as integral components of regional planning, but public policy begins more with serving human beings than nature. The respondents' interpretation of sustainable development bears little resemblance to how it is perceived within the literature. All four factors also assert that the news media play a key role in public awareness of Amazonia's ecological and economic challenges. The study suggests that Amazonia is a fertile area to evaluate the delicate interactions among policy makers and journalists as they face geopolitical, economic, environmental and social policy issues and attempt to apply principles of sustainable development.

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Introduction

The term sustainable development probably first surfaced in a 1970 Club of Rome report and was first widely discussed at a 1972 United Nations Conference on the Human Environment in Stockholm (Barbier, 1987; LePreste, 1989).[1] The term and underlying concept were brought to a global audience by the World Conservation Strategy in 1980 and to a series of related United Nations conferences and publications in the early 1980s to mid-1990s (World Commission on Environment and Development, 1987; United Nations Conference on Environment and Development, 1992; World Resources Institute, 1996; Doran, 1996; United Nations Conferences, 1970-1995). The publication of *Our Common Future* in 1987 by the World Commission on Environment and Development (1987) helped lead to a 1992 United Nations Conference on Environment and Development, which was followed by the well-publicized U.N. Earth Summit in Rio de Janeiro, Brazil in June, 1992 (United Nations Conference on Environment and Development, 1992; Haas, Levy & Parson, 1992; Logan, Tessier & Christiansen, 1995). At all of these meetings, sustainable development became the framework for debate and discussion regarding future international development efforts (World Resources Institute, 1996; Doran, 1996).

Although there is no widely accepted definition for sustainable development, the Food and Agricultural Organization of the United Nations (1990, p. 2) finds that sustainable development:

> is the management and conservation of (a nation's) natural resource base, and the orientation of technological and institutional change, to satisfy human needs for present and future generations. It conserves land, water, plant and animal genetic resources and does not degrade the environment. In some cases sustainability can only be achieved by complete protection; in others it may involve different levels of

[1]Redclift (1987) notes that the idea of sustainable development emerged when economists and international development officials began to perceive that planned economic growth and national development might be at odds. While international development efforts previously focused on growth, or increase in economic output, Redclift (1987) noted that while growth was seen as linear increases in a gross national product, a nation's economic status began to be discussed within its larger socio-cultural and ecological context. Le Preste (1989) explains that the shift in a theory of development represented an acknowledgement by officials in international agencies that former concepts overly focused on capital accumulation and industrial output without accounting for its social and environmental consequences.

investment and recurrent inputs.

The World Conservation Union adds that the use of the term also encompasses a national, regional, local or international investment policy that is responsive to a nation's or region's carrying capacity (the preservation of air, water and soil quality and biodiversity) and to the use of nonrenewable sources (particularly oil, gas, coal and minerals) at no greater rate than the creation of renewable substitutes. Implicit in the concept is the need for nations to monitor their stock of biological wealth and set ecological goals. The cost to developing nations of substituting for some nonrenewable resources and preserving or enhancing air, water quality and biodiversity is seen as equitably distributed across the international community, which means it is seen as partially borne by "developed" industrial nations (World Commission on Environment and Development, 1987).

But many experts (Pearce, Barbier & Markandya, 1984; Barbier, 1987; Daly, 1989; Jickling, 1994; Starr, 1996) argue that the concept of sustainable development is too vague and fungible; some assert the term is almost an oxymoron (Redclift, 1987). Redclift (1987) emphasizes that the confusion about the term makes it difficult to apply strategies to environmental or economic principles (see also, McManus, 1996; Gordon, 1993; Fisher & Black, 1995). More importantly, Barbier (1987), Redclift (1987), Jickling, (1994) and Milbraith (1995) explain that the confusion about the meaning of term creates a conceptual competition, where a spectrum of ideas concurrently vie for international attention and acceptance. Barbier (1987), Redclift (1987), Jickling (1994) and Milbraith (1995) note competing interpretations are a significant geopolitical policy issue because any hierarchy in how concepts are received may set policy directions in the future. Godt, Sachs and Uitto (1992), Goodland (1989, 1990, 1991), Goodman and Hall (1990), Redclift (1995) and Holl, Dailey and Ehrlich (1995) add that debate regarding the concept of sustainable development is particularly immediate in environmentally-sensitive areas, such as tropical rain forest regions, where massive economic development efforts are under scrutiny by national and international agencies (see also, Sachs, 1991; Leonard, 1989; Food and Agriculture Organization of the United Nations, 1990; Raven, Berg & Johnson, 1995).

At the 1992 Earth Summit in Rio de Janeiro, Brazil, there was a widespread consensus about the importance of developing Brazil's Amazon region under sustainable development principles (United Nations Conference on Environment and Development, 1992; Hass, Levy & Parson, 1992; Doran, 1996). Yet the frameworks discussed to

undergird sustainable development principles were so extraordinarily diverse that it was impossible to reach a consensus about the term's meaning. Redclift (1987) defines the frameworks implicit in sustainable development to include economic theories (such as Marxism, capitalism), ecological theories (such as biodiversity, population control, conservation) as well as geopolitical science, cultural studies and sociology (see also, Prakash, 1995; McManus, 1996; Milbraith, 1995). Other recent scholarship finds interpretations of sustainable development within disciplines as diverse as applied economics (Maillet, 1995; Lesser & Zerbe, 1995; Arrow et al., 1995); trade policy (Rosenberg, 1994) and scientific and technological applications—from genetic agricultural engineering (Giampietro, 1994) to synthetic fuels development (Leonard, 1996). Sachs (1991) and La Preste (1989) explain that the diversity of competition for the hearts and minds of policy makers currently in the Amazon region of South America often confuses issues and makes it difficult to create a consensus about principles and policies (for a similar view of challenges outside the region, see Milbraith, 1995).

The intensity of the debate in Brazil's Amazon region, however, has turned the debate about sustainable development into an important public policy issue and has established the region as one of the first international arenas where sustainable development is under serious discussion (United Nations Conference on Environment and Development, 1992; IUCN, 1980; Sachs, 1991; Hass, Levy & Parson, 1992). In addition, the debate about sustainable development has created interest in how the public comes to understand and assess sustainable development issues (Daly, 1989; Goodland, 1990; Logan, Tessier & Christiansen, 1995; Olson, 1995; MacManus, 1996; Prakash, 1995; Waddell, 1995; Holl, Daly & Ehrich, 1995). The capacity for Brazilian public opinion to influence policy decisions has resulted in interest among advocates of diverse environmental positions and policy makers in how the news media cover environmentally-related issues (Leonard, 1989; Hass, Levy & Parson, 1992; Corson, 1995; Holl, Daily & Ehrlich, 1995).

The staking of positions in the Brazilian Amazon, their competition for acceptance, and the role of the press seem consistent with patterns that Hilgartner and Bosk (1988) describe in the U.S. In their view, the formation of U.S. technological and science policy is rooted in differing interests among scientists, engineers, humanists, corporations and public officials, all of whom attempt to influence the news media to raise and frame issues as closely as possible within parochial profes-

sional perspectives. Hilgartner and Bosk further argue that ideas about technological and science policy first advance via spheres of influence within and between major professions. The professions, then, direct public relations activities primarily to journalists, who are seen as vital links to educating the public, raising awareness and helping form the public's perceptual frameworks regarding science policy issues. The interaction of various professions, including the press, as well as the role of community activists and organizations in the setting of U.S. environmental policy, was recently analyzed within Hilgartner and Bosk's framework by Hansen et al. (1993). These authors suggest the role of the news media is integral to a multidimensional understanding of public dialogue on environmental policy issues. Without understanding how journalists and policy makers evaluate their mutual roles as well as the ideas and concepts that influence environmental challenges, an analysis of environmental policy diffusion is incomplete.

In this study, 54 policy makers and leading environmental journalists in the Amazon region of Brazil assessed diverse interpretations of: (a) sustainable development; (b) international and local development policies; and (c) the news media's role in informing the public about sustainable development as well as complex environmental and national development issues. The intent of the study was to examine how opinion publics are forming among professionals in an evolving, fluid, vigorous debate about a key international, geopolitical issue—where Brazil stands on the world's stage. The study did not attempt to confirm a specific hypothesis about how sustainable development might be interpreted, or how international press theories, such as developmental versus social libertarian concepts, are perceived. Instead, the research attempted to ascertain how contested concepts might be reformulated to stake fresh positions that go beyond the narrow frameworks of most international press or environmental policy literature. The authors suspected that Amazonian policy makers do not cleanly interpret sustainable development or ideas about the role of the news media within the same parameters drawn by ecologists, economists, politicians, or journalism theorists (as Logan & Kerns, 1985, found in studying public policy and press issues in Jamaica). Instead, opinions among Amazonia's leading policy makers and journalists might reflect a blend of ideas that determine how the future of environmental policy might be regionally conducted in the near future.

Method

Q methodology was used to probe the structuring of attitudes and to allow factor structures to emerge among and between concepts of sustainable development, national development and differing perspectives regarding the appropriate role of the news media.[2] Q methodology is used to discover how psychographic, not demographic, profiles of non-randomly chosen opinion publics converge on a concourse of ideas (Stephenson, 1953, 1967; McKeown & Thomas, 1988). In contrast to most public opinion research, participants in Q studies are ideally well-informed, directly involved and concerned regarding the issues at hand (Stephenson, 1953, 1967). Similar to Bandura's (1977) social learning theory hypothesis, Q methodology assumes that factor predispositions may reflect future behavioral tendencies (Stephenson, 1953, 1967). Social learning theory distinguishes between public awareness, information, knowledge, and the formation of temporary opinions and attitudes and deep-seated belief structures, which are seen as more tied to behavioral patterns (Bandura, 1977; Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). Research undergirded by social learning theory, incidentally, suggests that the news media play an influential role on public judgments regarding complex scientific, biomedical topics (Farquhar, et al., 1984; Fielding & Piserichia, 1989; Simpkins & Brenner, 1984; Pettegrew & Logan, 1987; Flay, 1987; Reid, et al., 1992).

A set of unstructured interviews was conducted with Brazilian environmental policy officials and environmental journalists in May, 1993, in Manaus and Belem, Brazil. Interviewees were asked to discuss concepts of sustainable development, the role of local, national and international institutions in economic development in the Amazon, some of their ideas about specific public policies for the region, and their perspectives on the role of the news media in informing the public about the region's economic and environmental challenges. Statements of opinion were taken from interviews as well as the literature about sustainable and national development issues and literature about the role

[2]Q methodology is explained in: Stephenson (1953, 1967) as well as McKeown & Thomas (1988).

of a democratic news media in international development.[3] Duplicate statements were eliminated. The statements were organized into four dimensions referred to in the Appendix as: (A) sustainable development definitions and concepts; (B) assessment of the role of national, local and international institutions in the Amazon's development; (C) comments about specific public policies for the Amazon region; and (D) the role of the news media. Statements about sustainable development concepts and assessments of the roles of institutions and policies were sampled from the literature to represent wide differences of opinion (see, for example: World Commission on Environment and Development, 1987; Pearce, Barbier & Markandya, 1984; Barbier, 1987; Daly, 1989; Redclift, 1987; Sachs, 1991; Raven, Berg & Johnson, 1995). Likewise, statements regarding the role of the news media were drawn to reflect differences of opinion in unstructured interviews or in the literature regarding the press's responsibilities for economic development and public education within democratic, Third World nations (see, for example: Altschull, 1984; Hachten, 1981; Logan & Kerns, 1985). More than 250 statements were reduced to 48 opinion statements, or Q items, with 16 statements representing each dimension, which were balanced to reflect opposing points of view.

The Q sample was written in English and translated into Portuguese. The Portuguese and English versions were pre-tested for translation accuracy and clarity by six officials (two ecologists, two economists and two journalists) at the National Institute for Research in the Amazon in Manaus, Brazil in late fall, 1993. The final English and Portuguese versions of the Q sample were administered in December, 1993; participants could choose to answer the instrument in either language. Environmental policy makers and journalists (n=54) were chosen from key regional institutions and participated in the research through spring, 1994.[4]

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[3]Stephenson notes the dimensions in Q samples should be isomorphic with the issue raised in the concourse of opinion obtained from interviews or literature reviews, rather than the investigator's predispositions.

[4]Participating institutions included: Brazil Secretariat for Science and Technology; National Council for Scientific and Technological Development; Superintendent for the Development of the Amazon Region; Federal University of Para (a Brazilian state within Amazonia); Emilio Goeldi Museum (a leading ecological museum and environmental research institute in Belem, Brazil); Center for Agroforestry Research of the Eastern Amazon; College of Agricultural Science of Para State; Para State Secretariat of Science,

All participants were non-randomly chosen and deliberately represented a cross-section of economists, social scientists, environmental scientists (ecologists, biologists, geneticists, geophysicists), public health experts, public officials, administrators of environmental institutions and journalists highly familiar with the issues facing the Amazon region. The respondents included 21 scientists, 19 administrators and 13 journalists; 14 women and 39 men. Forty-one of the respondents completed graduate degrees, 10 persons received undergraduate degrees and two persons (both journalists) attended some college. All participants were professionals formally engaged in setting environmental policy in the Amazon region via direct participation in or reporting on international developmental planning meetings arranged via United Nations agencies or the World Bank. All participants negotiated or frequently discussed international and regional Amazonian planning with the other respondents as well as with international and regional development officials. The aggregate group was deliberately chosen to represent a critical mass of persons whose dialogue about planning issues is highly influential in setting national and international policies for the region.

Q methodology employs a forced distribution ranking procedure that requires opinion statements to be sorted in a balanced, quasi-normal distribution.[5] Respondents' individual rankings of the 48 statements were correlated and four factors were derived from principal components factor matrix, subject to a varimax rotation. The number of factors was determined by an Eigenvalue of 1.0. The Guilford-Lacey expression was used to determine significant factor loadings, in this

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Technology and the Environment; Institute for Socio-Economic Development of Para State; Dario Do Para (a mass circulation newspaper); several news magazines; and Liberal Television–Globo Network, a commercial television service, and Cultural Television–Brazil's public television network.

[5]Forced distribution ranking procedures in Q methodology are not so much for computational convenience as for the assumption that for any assortment of opinion statements on a given topic, this forced distribution will be isomorphic with the actual situation, i.e., the subject will agree with approximately as many items as he disagrees with, and he will feel strongly about a relatively small number of statements. Also, some statements will be placed in the middle of the distribution (the neutral area) because they are not relevant or meaningful, rather than because the respondent has no opinion about them, *per se*. To test this assumption, respondents are asked which column represents neutrality for them. They are also asked to comment on their placement of statements at the extremes of the distribution.

case greater than .40, which is statistically significant ($p < .05$). Weightings based on a respondent's factor loadings were applied to individual statement rankings so factors could be represented as arrays of statements using normalized statement (or z) scores. The normalized factor arrays for each Q statement and assigned dimensions are displayed in the Appendix. Four factors, or patterns of opinion-organization, were interpreted from the normalized statement arrays incorporating some information from post-sorting interviews. Post-sorting interviews ensured that factor interpretations and the perspectives of each respondent were isomorphic.

Findings

Of the 54 respondents, 25 persons loaded on factor one, seven persons loaded on factor two, 15 persons loaded on factor three and six persons loaded on factor four. One person was "confounded," or had multiple loadings on two factors. Labels assigned to each factor were based on factor interpretations and demographic information about respondents, which was supplied to the authors. In the narrative interpretation of each factor, references refer to Q items in normalized factor arrays in the Appendix. Similarities, differences and consensus items between factors are woven into factor interpretations.

Factor One: Locally Oriented Idealists

Factor one's 25 defining variates are a mix of 11 scientists, nine environmental administrators or public policy officials and five journalists. Factor one's interests are local: Most statements that are strongly supported or rejected focus on regional issues and include "Amazonia" in the first few words. At the same time, factor one embraces broad principles, such as the notion that Amazonia is so heterogeneous that the same approach to sustainable development across the region seems unwise. Factor one supports the idea that sustainable development means finding a balance between economic growth and preserving natural resources. Factor one firmly believes that the Amazon's growth and development cannot ignore the carrying capacity, resilience and diversity of the region's ecological resource base. Factor one takes issue with criticisms of local efforts to educate and develop Amazonia's native population. Factor one strongly disagrees that a serious depletion of natural resources is inevitable if the Third World hopes to develop a standard of living similar to North America or

Western Europe. In contrast to factor two, factor one strongly disagrees that the economic and environmental focus in sustainable development should be shifted to aggressive population control. Factor one also rejects the idea that population growth is an obstacle to sustainable development.

Factor one is equivocal about specific plans to develop the Amazon or about the role of international corporations or agencies. Similarly, factor one avoids critiquing local or international press reporting about Amazonia's economic development. Factor one ranks statements about all these issues in neutral or less salient categories.

Factor one does respect the news media's agenda-setting role. Factor one rejects the idea that the Brazilian press has less impact on Brazilian public opinion than public officials or scientists. However, factor one remains interested in overarching concepts about environmental quality and sustainable development and growth in the Amazon. Factor one remains neutral about specific strategies, and are labeled idealists here because they do not associate issues such as population control, governmental policy, corporate rights and responsibilities and international economic investment in the region with accomplishing their goals to improve the quality of life for their neighbors.

Factor Two: Internationally Oriented Pragmatists

The seven persons whose Q sorts define factor two include two journalists, two administrators of ecological research institutions and three environmental scientists with advanced degrees in Natural Resources.

Similar to factor one, factor two strongly believes that the Amazon's natural heritage needs to be preserved through careful planning of resources, so present and future generations can benefit from its natural legacy. But factor two disagrees that the concept of sustainable development is more about preserving local culture, religion, aesthetics and ethics than about economic or environmental issues. Factor two is distinguished from other groups by a strong belief that environmental conservation is assured by meeting local needs for economic growth and improvements in the quality of life. Environmental issues are secondary to social and economic development needs. To meet local needs, factor two strongly believes that an inability to control population growth is a severe obstacle to sustainable development principles. But factor two rejects the idea that preserving biodiversity should be a primary consideration in national planning efforts.

In contrast with the other groups, factor two wants international corporations and institutions to invest in and send more experts to Amazonia and refrains from criticizing multinational corporations. Factor two distinctively rejects the idea that Brazilian scientists have the expertise to plan the region's environmental preservation but are ignored nationally and internationally. Although factor two asserts that chemical and pharmaceutical companies have a special responsibility to invest in Amazonian preservation efforts, this view hopes multinational corporations will continue to contribute to sustainable development in tropical rain forest areas via technology transfer, financial investment and resource planning. In addition to improving the climate for international interest and investment in the region, factor two wants to focus on population controls, improve local infrastructure and set aside any broad ecological theories that conflict with their regional priorities.

Finally, factor two wants better trained journalists. Factor two believes that better prepared science and environmental journalists are essential to Brazilians and the international community to improve understanding of Amazonia's development problems. But factor two does not have strong feelings regarding other issues about the news media's role and places most critical statements about the press within a neutral ranking.

Factor 3: Regional Architects

The 15 persons who load on factor three include four scientists, five administrators of regional academic institutions and six journalists. In contrast to factor two, the disciplinary backgrounds of the scientists and administrators are biology, medicine, geophysics, agronomy and medicine instead of natural resources.

Similar to factors one and two, factor three believes that Amazonia's economic future must be carefully planned. Factor three disagrees sharply with the idea that the concept of sustainable development is more about preserving local culture, religion, aesthetics and ethics than economic or developmental issues. Within economic and developmental issues, factor three agrees that sustainable development means finding a balance between economic growth and natural resource preservation. Factor three firmly believes that growth and development in the region cannot ignore its ecological carrying capacity. More specifically, factor three is concerned with two carrying capacity issues—the preservation of genetic diversity and depletion of natural resources. But factor three asserts that economic and social needs should undergird Amazonia's development plans. After weighing some paradoxical options, factor

three finds that environmental conservation is first assured by meeting the needs for economic growth and improving the quality of life.

Factor three endorses the right of Amazonia's citizens to determine the use of their region's natural resources. To factor three, the Brazilian and international news media can play a special role to educate the public about Amazonia's economic needs and environmental challenges. Factor three believes the Brazilian press is probably more influential on public opinion than public officials or the scientific community. Factor three similarly believes that the international press is influential in informing citizens about the Amazon's challenges. Factor three rejects the idea that public interest outside Brazil will not be stimulated even if the international press begins aggressive reporting about the region's economic growth and ecological problems.

In contrast to factor two, factor three is critical of the contributions of some multinational corporations to regional planning efforts. Factor three sharply disagrees that multinational firms contribute to sustainable development efforts via technology transfer, financial investment and resource planning. Factor three agrees that Amazonia's survival depends on protection from efforts to overdevelop the region that are mostly financed from outside Brazil.

Regarding specific development strategies, such as questions about large scale commercial agriculture and land titles to minimize unnecessary clearing of forests, factor three is neutral. Factor three is similarly reluctant to criticize the Brazilian or international press and remains noncommittal about these issues.

Unlike the other factors, factor three clarifies some priorities regarding economic growth, endorses the preservation of biodiversity, notes that there are specific challenges if the quality of life in Amazonia is to be improved, and welcomes reporting about these issues.

Factor Four: Conservative

The six persons with pure loadings on factor four include two scientists, three administrators and one journalist. The scientists and administrators in factor four have an agronomy background or have interests in agricultural issues. In aggregate, press criticisms and specific agricultural development strategies were more salient to factor four than to the other groups.

In terms of agricultural policy, factor four agrees that one of the uncertainties in the Amazon's agricultural development is the conversion of forest lands to genetically uniform cultivated crops. Factor four

agrees that large scale commercial agriculture is feasible on the Amazon flood plain. Factor four disagrees that land titles in Amazonia should be issued to minimize unnecessary clearing of forest areas and to maximize soil and water conservation.

Positions that endorse property rights for agricultural development and minimize an emphasis on regional planning are distinctive in factor four and represent a conservative position among Brazilian policy makers (for contrast, see Lescure, 1994).

Similar to two other groups, factor four agrees that the Brazilian press is influential in comparison with public officials and scientists. Factor four also endorses better training for science and environmental journalists, so they can better understand the Amazon's developmental and ecological challenges. Factor four is very interested in international press coverage and media recognition of the Amazon's regions economic potential and environmental challenges. But in contrast to the other groups, factor four sharply rejects the idea that the Brazilian press coverage of economic growth in the Amazon is too favorable toward environmentalists. Because of continuing, questionable news coverage by the international press, persons on factor four are very critical that North Americans and Europeans are not well-informed about problems in the Amazon and other rain forest regions. Similarly, factor four believes Brazilians also are not well-informed about Amazonia's problems. Factor four links public misunderstandings to the quality of reporting by Brazilian journalists.

Although factor four is clearly interested in sustainable development of the Amazon, their perspectives are more self-contradictory than the other factors. Factor four recognizes that sustainable development means finding a balance between economic growth and preserving natural resources; however, they counter that economic growth and improvement of the quality of life is the highest priority. Although factor four asserts that economic growth cannot ignore the region's ecological carrying capacity, they concede that a serious depletion of natural resources is inevitable if the Third World hopes to develop a standard of living similar to that in North America or Western Europe. Factor four, in short, differs from the other groups because factor four avoids choosing any priorities to adjudicate ideas or resolve policy applications when economic and ecological needs conflict.

Conclusions

Overall, the four factors represent pluralistic perspectives about sustainable development, economic development priorities and assessment of the press' function, although there are significant differences in factor orientations. Factor one mostly appraises issues according to what would be ideal for Amazonia without salience of regional, or global issues such as population control, biodiversity and specific agricultural policies. Factor two takes a global financial approach and encourages international corporate investment coupled with managerial assistance. Factor three best comes to grips with the paradox of improving the Amazon's quality of life and ecological preservation. Given a difficult choice, factor three prefers economic growth but is mindful of monitoring the region's resources to preserve biodiversity. Factor four is most concerned about specific agricultural policy and property rights issues and is highly critical of the Brazilian and international press for allegedly misinforming the public about environmental and development issues.

Consensus statements among the four factors reveal that Amazonia's policy makers: (1) widely accept that economic development and ecological preservation need to be balanced; (2) have difficulty defining sustainable development; (3) have difficulty applying sustainable development concepts to public policy; (4) have difficulty providing specific tactics for economic development and environmental protection; (5) are uncertain about future policy direction; and (6) avoid framing ideas about development and conservation along the lines suggested by many ecologists, economists, or humanists.

Among the factors, there is little endorsement of key ecological concepts such as biodiversity, agroforestry or population controls. The factors often back off criticisms of regional and national governments, international agencies, multinational corporations or of most professions, including the news media.

All four factors assert that the news media play a key role in public awareness about Amazonia and its ecological and economic challenges. The press is sometimes seen as more credible with the Brazilian public than public officials or scientists. Consistent with Hansen's (1993) view, all four factors perceive that media performance is not peripheral to a national dialogue about environmental and developmental policy issues.

All four factors also place the economic welfare of Amazonia's residents above all other considerations. Cultural stability and the

environment are seen as integral components of regional planning, but public policy begins more with serving human beings than nature. The concern for the economic welfare of Amazonia's citizens clearly provides some basis for common ground among the respondents in determining future public policy.

Nevertheless, while the concept of sustainable development may be appreciated among key Brazilian policy makers, it is not the linchpin for future decision making. Sustainable developmental concepts are part of a dialogue regarding regional policy decisions, but related ecological concepts appear to be perceptually grafted onto more fundamental economic and human developmental concerns.

The conceptual grafting, or unusual combinations of perspectives within factors, certainly reveals how Q methodology elucidates a multidimensional spectrum of opinion. The respondents' interpretation of sustainable development bears little resemblance to how it is perceived within the literature. All four factors interpret sustainable development more broadly than interpretations grounded in applied economics (Lesser & Zerbe, 1995; Arrow et al., 1995); trade policy (Rosenberg, 1994) scientific and technological applications (Giampietro, 1994; Leonard, 1996), sociology (McManus, 1995), cultural studies (Prakish, 1995), or ecological and economic principles (Redclift, 1987; Maillet, 1995; Gordon, 1993; Fisher & Black, 1995). Many Brazilian opinion leaders reject hierarchial, disciplinary-based thinking and conceive sustainable development along interdisciplinary, less predictable, lines.

While the path to societal sustainability is conceptually uncertain and may be strewn with some of the barriers, opponents and traps that Milbraith (1995) suggests, the paradoxes, and inconsistencies found in the four factors actually may represent more opportunities for mutual understanding than narrower interpretations often found in scholarly literature. Three of the four factors certainly suggest that Castle et al.'s (1996) appeal for more pragmatism and pluralism in applying sustainable development principles to public policy might be favorably received in Amazonia.

Future studies might focus on the reluctance of Brazilian policy makers to frame public policy issue-agendas around environmentally-oriented principles. The diffusion of ecological and developmental concepts among scientific professions, governmental administrators, academic administrators, non-scientific faculty and environmental reporters should be very interesting to follow. While this study suggests that it may be difficult for policy makers to reach a consensus about specific tactics in Amazonia in the future, a perceptual shift (particular-

ly one that more embraces nature's welfare) could have a significant impact on strategic and tactical planning.

Finally, the study suggests Amazonia is a fertile area to evaluate the interactions among scientists, humanists, journalists and administrators as they face key geopolitical, economic, environmental and social policy issues. Brazilian policy makers clearly believe that careful national economic and environmental planning should be grounded in principles of sustainable development. But how other planning and ecological strategies are to be framed is currently uncertain—a state of affairs with enormous implications for the environment, for sustainable development, and for the news media that eclipse Amazonia's borders.

Appendix: Statements and Factor Scores

	z-scores				
	Type 1	Type 2	Type 3	Type 4	Dimension
1. The highest priority in sustainable development is the preservation of genetic diversity.	-0.1	-1.2	0.8	0.2	A
2. The highest priority in sustainable development is to not deplete Amazonia's natural resources.	-0.7	-0.5	0.5	0.1	A
3. The highest priority in sustainable development is to provide jobs and a better quality of life for more Brazilians.	-0.5	-0.3	-0.6	0.7	A
4. Environment conservation is assured by meeting the needs for economic growth and for improvement of quality of life.	1.7	2.0	1.5	1.7	A
5. Sustainable development means finding a balance between economic growth and preserving natural resources.	1.8	0.6	1.5	1.2	A
6. Sustainable development must be a process that considers future more than present economic needs.	-0.9	-0.5	-0.8	-0.7	A
7. Sustainable development stands for self-reliance, local control of resources and community empowerment.	0.7	0.2	0.3	0.6	A
8. The concept of sustainable development is more about preserving local culture,	- 1.1	- 2.3	- 1.2	- 0.5	A

religion, freedom, aesthetics and ethics than economic or environmental issues.					
9. Environmental issues are important, but social and economic needs are the primary consideration in national development strategies.	0.5	0.5	0.4	0.3	A
10. Population growth is a severe obstacle to sustainable development.	-1.1	1.3	-1.0	-0.2	A
11. The concept of sustainable development is too vague; it seems to mean different things to special, vested interests.	0.2	0.1	-0.1	-0.3	A
12. The concept of sustainable development is too new to precisely define.	0.2	0.2	-0.4	-0.3	A
13. Amazonia's survival depends on protection from efforts to overdevelop the region that are mostly financed from outside Brazil.	-0.1	-1.4	0.8	0.3	B
14. Since Amazonia's natural resources are globally beneficial, the cost to preserve the region should be paid for internationally.	0.7	1.1	0.6	0.2	B
15. Chemical and pharmaceutical companies have a special burden to pay for environmental preservation efforts in Amazonia because these firms profit from the region's natural resource and economic development.	0.3	-1.4	-0.0	-0.3	B
16. Amazonian citizens have the right to decide the use of the region's natural resources.	1.4	0.9	1.7	1.3	B
17. Indigenous governments–not the world's industrial nations–are responsible for most of the environmental damage to tropical rain forests.	-0.0	-0.2	-1.1	-1.0	B
18. The Amazon's natural heritage must be preserved through a carefully planned use of its resources, so that present and future generations may benefit from the region's natural legacy.	1.6	1.8	2.2	1.3	B
19. The real future of environmental research is within the developing world–particularly in tropical rain forest areas.	-0.4	-0.4	0.1	0.2	B
20. Multinational corporations already contribute to sustainable development	-1.2	-1.3	-1.6	-1.8	B

efforts in tropical rain forest areas via technology transfer, financial investment and resource planning.					
21. If industrialized countries want to constructively assist in Amazonia's preservation, they should send scientists and fund local environmental research.	1.0	1.1	-0.2	1.1	B
22. A prudent approach to developing the Amazon region depends on international planning, which is politically difficult to achieve.	0.3	-0.3	0.1	0.4	B
23. The discussion about sustainable development demonstrates the international community is responding to the exploitation of the Third World's natural resources by local, national or international interests.	-0.7	-0.9	0.2	-0.1	B
24. A serious depletion of natural resources is inevitable if the Third World hopes to develop a standard of living similar to North American or Western Europe.	-1.9	-1.6	-2.3	1.3	B
25. The economic and environmental focus in sustainable development should be shifted to aggressive population control.	-1.7	0.6	-1.1	-1.7	C
26. Governmental infrastructure and cooperation in the Amazon helps prevent the region's ecological deterioration.	- 0.8	0.1	-0.4	-0.9	C
27. Growth and development in Amazonia cannot ignore the carrying capacity, resiliency and diversity of the region's ecological resource base.	1.5	0.9	1.7	1.6	C
28. The traditional rights of indigenous people need to be protected throughout the Amazon region.	1.3	1.4	1.3	1.6	C
29. One of the uncertainties in Amazonia's agricultural development, is the conversion of forest lands to genetically uniform, cultivated crops that might promote the loss of genetic diversity and some natural resources in the region.	0.4	0.1	0.1	1.0	C
30. Large-scale commercial agriculture is feasible on the Amazon flood plains.	0.5	-0.2	-0.1	0.7	C
31. Indian reservations are nothing else	-2.3	-1.4	-1.1	-1.5	C

but human zoos.					
32. Land titles in Amazonia should only be issued to minimize unnecessary clearing of forest areas and maximize soil and water conservation.	-0.8	-0.6	-0.5	-1.0	C
33. Brazilian scientists have the expertise to plan Amazonia's environmental preservation; but too often their advice is ignored by Brazilian politicians or international planning agencies.	0.5	-1.3	0.2	-0.1	C
34. The knowledge of indigenous people about preserving nature must be gathered and used in Amazonia's development.	1.2	0.8	0.9	0.7	C
35. Amazonia is so heterogeneous that the same approaches to sustainable development across the region seem unwise.	1.9	1.7	1.6	1.0	C
36. More industrialization has to be brought into the Amazon to improve the standard of living in the region.	-0.1	0.0	-1.1	0.0	C
37. The Brazilian mass media's coverage of economic growth in the Amazon is too favorable toward environmentalists.	-0.6	0.4	-0.7	-1.9	D
38. The international press's coverage of development in the Amazon is too critical of Brazil's economic development efforts.	-0.1	0.3	0.0	-0.5	D
39. The role of the Brazilian press is to educate the public about Amazonia's economic needs and environmental challenges.	0.5	0.4	0.5	-0.4	D
40. The Brazilian press has less impact on Brazilian public opinion about Amazonia than public officials or scientists.	-1.0	-1.1	-1.4	-1.7	D
41. To fill a void of national leadership, the Brazilian press has to help set public policy for Amazonia's development and environmental conservation.	-0.5	0.5	0.0	-0.2	D
42. Public interest outside Brazil in Amazonia's problems will not occur even if the international news media begins aggressive reporting about the region's economic growth and environmental challenges.	-1.0	-0.7	-1.5	-1.0	D
43. The role of Brazilian newspapers,	-0.3	-0.1	0.3	-0.4	D

television and radio news is to uncover and expose officials and experts whom are responsible for environmental deterioration.					
44. Improved training for science and environmental journalists is essential for Brazilians and the international community to better understand Amazonia's development problems.	1.0	0.9	1.2	1.0	D
45. Better mass media coverage of Amazonia's economic and environmental problems will not occur until Brazil's political and corporate institutions develop the infrastructure and tradition to be responsive to the press.	0.4	0.5	0.1	0.3	D
46. Many North Americans and Europeans seem well-informed about the problems in the Amazon and other tropical rain forests, which probably results from years of accurate news reporting.	-0.8	-1.1	-1.3	-2.0	D
47. Brazilians, who are well-informed about the problems in the Amazon, often credit good reporting by Brazil's national news media.	-0.7	-0.7	-0.6	-1.6	D
48. Journalists want a quick story about environmental catastrophes and usually ignore long range environmental questions and issues.	-0.1	-0.1	0.2	0.7	D

Dimensions: A= sustainable development concepts; B= role of national, international agencies, groups in economic development; C= public policy concepts & strategies within the Amazon Region; and D= opinions about the role of the news media.

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