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E-Waste Policy in Developing Countries: The context of Nigeria

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Abstract

The use of ICTs in developing countries has grown significantly since the start of the 21st century (ITU 2012), driven on by encouraging evidence and literature that associates ICTs with various aspects of economic and social development (UNCTAD 2011). However, ICT equipment, which is supposed to help developing countries improve education and stimulate economic growth may undermine the sustainability of ICT use, and have negative impact on human health, and the environment, if not addressed. The environmental concerns regarding e-waste stem from the hazardous elements and compounds that can be found in everyday e-waste. These compounds are known to have adverse impacts on the health of the environment and all living beings. Most developing countries, including Nigeria, have neither a well-established system of disposal of e-waste nor a legislation dealing specifically with e-waste and a lax enforcement of existing laws dealing with general waste management. (Nnrom and Osibanjo, 2008) The aim of this paper is to discuss a theoretical framework which will be used as a 'sensitizing device' for a qualitative study of the issues and challenges associated with-waste policy formulation and implementation process in Edo state, Nigeria.(Myers, 1977).

Key words: Policy development, environmental impact, ICT waste management and Developing countries.

Introduction

E-waste management in developing countries is a growing and challenging problem. This is primarily due to a lack of infrastructure (Ditka et al., 2008), but also a lack of adequate policy and policy implementation processes (Widmer et al., 2005) to ensure that e-waste are discarded properly without causing threat to the environment and the health of people. Nigeria, like many developing countries, is faced with huge challenges in the management of Waste Electrical/ Electronic Equipment (WEEE), which are either internally generated or imported. The problem of illegal importation of e-waste has become a source of concern because of the high volume containers of unusable ICT equipment arriving monthly through Lagos port with an average 400,000 second hand or scrap PCs. (Puckett et al., 2008; Brigden et al., 2005; Deutsche, 2007; Cobbing, 2008)

The aim of this paper is to discuss a theoretical framework, which will be used as a 'sensitizing device' (Klein & Myers, 1999) that was built for a qualitative study of the issues and challenges associated with-waste policy formulation and implementation process in Edo state, Nigeria. The paper addresses the following research question:

What are the issues and challenges associated with e-waste policy process in Edo state?

Our paper uses Stewarts (1998) view of the policy process; "The policy process defines how the multitudes of demands are translated into the outputs that meet these demands" (Stewart, 1998, p 106). The policy process by this definition articulates the approaches, systems and mechanisms that delimits how demands expressed in the form of needs and aspiration of citizens would be satisfied through public or private interventionism. The policy process is subsequently not an action confined to the public sector only, but to organizations and institutions not under the umbrella of the government.

The next section presents the theoretical framework developed for the study. We then follow our presentation of the framework with a grounding of this model in the context of Edo State and the Nigerian environment. Finally, the paper concludes by discussing implications of the model in the context studied.

A Theoretical Framework for E-Waste Policymaking and Implementation

The model shown in Figure 1 was developed with a view to gain an understanding of the challenges and issues in e-waste policy formation process in Edo State. It is a “sensitizing device” (Klein & Myers, 1999) that allows us to develop some ideas about the research question and concepts that might be helpful for that question. It considers policy cycles and processes, policy types and characteristics, policy implementation, e-waste sources and e-waste characteristics. Legislative factors, National policy, economic issues and technical issues were also taken into consideration.

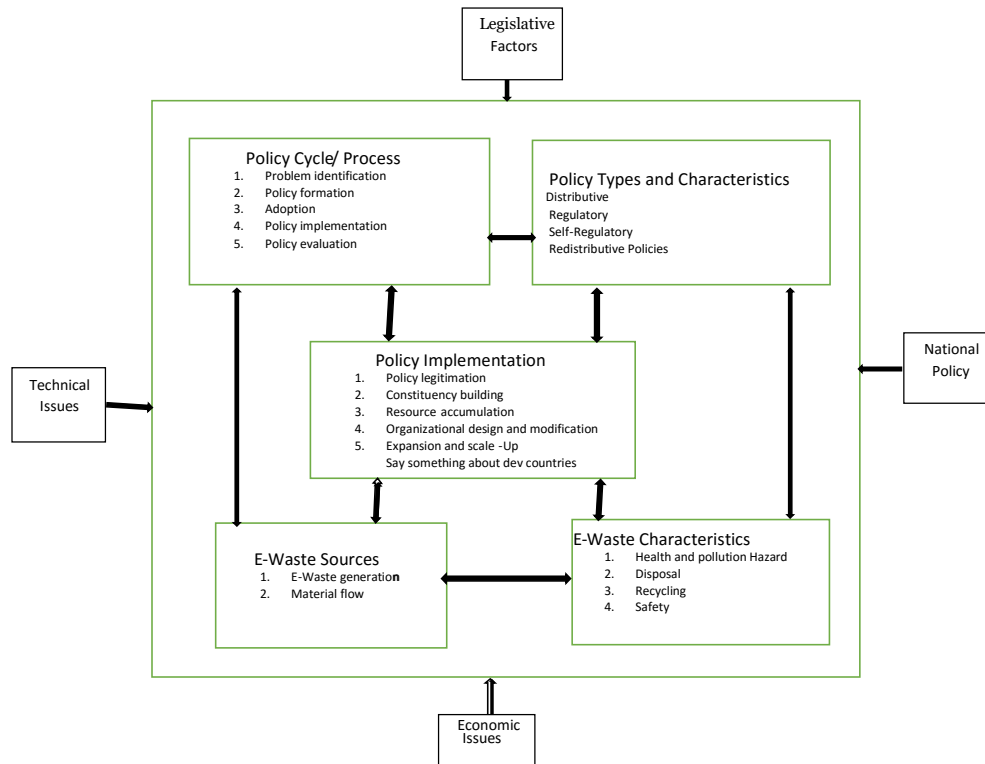


Figure 1. A Theoretical Framework for E-Waste Policymaking and Implementation

Policy cycle / process

Policy cycle is a guide, or heuristic, for policy development; it 'brings a system and a rhythm to a world that might otherwise appear chaotic and unordered' (Althaus et al., 2013, p. 32). The policy cycle, or sequenced policy process, was initially proposed in the seminal work of Lasswell (1951), and subsequently adopted by others (Brewer, 1974; Jenkins, 1978; Brewer and deLeon, 1983; and deLeon, 1999). Howlett and Ramesh had a similar cycle but with more steps: agenda setting (problem recognition), policy formulation (proposal of a solution), decision-making (choice of a solution), policy implementation (putting the solution into effect), and policy evaluation (monitoring results) (Howlett and Ramesh, 1995, p.10). Bridgman and Davis (1998) advocate an eight-step “Australian Policy Cycle”: identify issues; policy analysis; policy instruments; consultation; coordination; decision; implementation; and evaluation.

Hogwood and Gun (1994) also envisage a similar cycle: issue search or agenda setting, issue filtration, issue definition, forecasting, setting objectives and priorities, options analysis, policy implementation, evaluation and review, and policy maintenance, succession or termination.

The literature proposes several different theoretical frameworks to describe the policy process. Although no single framework claims to describe the process completely in all cases, most frameworks try to provide useful descriptions of certain aspects of the process.

To provide a conceptual framework to guide the examination of the policy process in this paper, the following categories or stages are employed. Some illustrative questions are included.

Problem identification and agenda setting

There is an infinite number of environmental issues that could reach the agenda of decision makers. Political scientists have been quite active in researching the process by which issues gain ascendancy as they compete for the limited attention of policy makers (Kingdom, 1984; Dearing and Rogers, 1996; Downs, 1972).

The focus here is on how the problems that may become the targets of public policies are identified and specified. Why only some problems, out of all that exist, receive consideration by policy-makers requires an examination of agenda setting; that is, how governmental bodies decide what problems to address. What is a public problem? Why does some condition or matter become a public problem? How does a problem get on a governmental agenda? Why do some problems not achieve agenda status?

Formulation

Policy formulation refers to the development of proposed courses of action for dealing with public problems. Existing studies of the policy process in several countries show that policy making is a complex exercise which involves a large number of actors (Lindblom, in Richardson and Baldwin, 1976:127). This encompasses the creation, identification, or borrowing of proposed courses of action, often called alternatives or options, for resolving or ameliorating public problems Richardson and Baldwin (1976) raise so interesting questions, such as: Who participates in policy formulation? How are alternatives for dealing with a problem developed? Are there difficulties and biases in formulating policy proposals?

Adoption

This involves deciding which proposed alternative, including taking no action, will be used to handle a problem. In Nigerian legislatures this function is performed by majorities. How is a policy alternative adopted or enacted? What requirements must be met? Who are the adopters? What is the content of the adopted policy? (Anderson, 1975)

Implementation

The policy-implementation phase has always taken a back seat to the policy-formulation phase of the policy cycle. This is understandable because the public perceives the major policy battle as being fought over defining the policy itself. Ingram and Mann (1980) maintain that implementation is so difficult to achieve that we should actually be surprised when there is any positive accomplishment arising from the policy itself. Administrative agencies are seen as the front-line organizations for implementation because they are charged with the responsibility of carrying out the dictates of policy. However, expertise, to some extent, is located within administrative/regulatory bodies, and these organizations also rely heavily on outside experts as well.

Evaluation

Anderson,(2003) stated that policy evaluation entails activities intended to determine what a policy is accomplishing, whether it is achieving its goals, and whether it has other consequences. Who is involved? Who is advantaged and disadvantaged by a policy? What are the consequences of policy evaluation? Are there demands for changes in or repeal of the policy? Are new problems identified? Is the policy process restarted because of evaluation? Within this simplified framework, the formation and implementation of policies are seen as political in that they involve conflict and struggle among individuals and groups, officials

and agencies, with conflicting ideas, interests, values, and information on public-policy issues. The environmental arena is no exception to the general rule. Davies and Mazurek (1998) state that full evaluations of environmental policies are all too rare.

Policy Types and Characteristics

Policy types are defined as distributive, regulatory, self-regulatory, or redistributive by (Lowi, 1964). This typology differentiates policies by their effect on society and the relationships among those involved in policy formation. Distributive policies involve allocation of services or benefits to particular segments of the population—individuals, groups, corporations, and communities. Redistributive policies involve deliberate efforts by the government to shift the allocation of wealth, income, property, or rights among broad classes or groups of the population, such as haves and have-nots, proletariat and bourgeoisie. The usual pattern in redistributive policy shifts resources from haves to have-nots. Self-regulatory policies involve restricting or controlling some matter or group. Self-regulatory policies are usually more controlled by the regulated group as a means of protecting or promoting the interests of its members (Lowi 1964). Charities would be a good example of this.

Regulatory policies impose restrictions or limitations on the behaviour of individuals and groups, and it is in this category that e-waste policy falls. The formation of regulatory policy usually features conflict between two groups or coalitions of groups, with one side seeking to impose some sort of control on the other side, which customarily resists, arguing either that control is unnecessary or that the wrong kind of control is being proposed. Amid this opposition, regulatory decisions involve clear winners and losers, although the winners usually get less than they initially sought. For example, Lowi (1964) points out that when the winners are public interest groups, they may not gain direct material benefits from policies which, like the Clean Air Act, provide broad social benefits. It is often difficult, however, to identify all the purposes and consequences of regulatory policies. Regulatory policies take several forms. Some regulatory policies set forth general rules of behaviour, directing that actions be taken or commanding that others not be taken. Lauridsen and Jorgensen (2010) argue in their paper that a transition or life cycle approach should be taken for e-waste policies.

Policy Implementation

The implementation of significant policy change in any country is challenging, but for developing countries, implementing major policy shifts poses special challenges. Policy implementation takes different shapes and forms in different cultures and institutional settings. This point is particularly important in an era in which processes of 'government' have been seen as transformed into those of 'governance' (Hill and Hupe, 2002, p1). Implementation literally means carrying out, accomplishing, fulfilling, producing or completing a given task. The founding fathers of implementation, Pressman and Wildavsky (1973) define it in terms of a relationship to policy as laid down in official documents. Policy implementation is not necessarily a coherent, continuous process; instead, it is frequently fragmented and interrupted. Policy change often requires difficult changes in the supporting stakeholder coalition, changes in the structures and rules of familiar institutions, and new patterns of interaction (Ayee, 1994; Mazmanian and Sabatier, 1989; White, 1990). Policy implementation is often multidimensional, fragmented, and unpredictable. The Implementing Policy Change Project has developed a framework that divides policy implementation into six tasks, some similar to the components of the Policy Circle (USAID, 2000). The six tasks are legitimization, constituency building, resource allocations, organizational structure, mobilizing action and monitoring impact (Cross et al., 2001).

E-Waste Sources

E-waste sources in Nigeria falls into two categories. Internally generated or through material flow of the large import of second hand goods.

E-waste generation

E-waste is either internally generated or imported from other countries, however, the main sources of e-waste in Nigeria are; waste electronic products from households such as refrigerators, electrical irons, electrical fans, televisions, vacuum cleaners, toasters, blenders, water heaters, DVD and VCRs, stereo players etc. (BAN, 2005). E-waste is also generated from waste electronic products from government institutions and private enterprises, such as photocopiers, fax machines, computers, telephones etc. Also contributing to the e-waste stream are defective electronic products (known as defective imports) found among the electronic products imported into Nigeria. Used electrical electronic (EE) products imported into Nigeria as second hand goods, and charitable gifts, either have a short life span, or are already damaged goods. Other e-waste sources include wastes shipped into Nigeria by developed countries, pursuant to agreements between countries wherein the latter promises aid, money or the execution of a project within the territory of the recipient nation (Aniyie, 2009). Because of the high costs of safer recycling processors, developed countries have found it convenient to ship their e-waste to developing countries, where regulations are lax, and labour is cheap (Puckett et al., 2012).

Material flow

Most of the consumed EEE is imported into Nigeria, while there are only some assembling companies. In 2010 import statistics indicate that the share between new and used EEE was about 50%/50%, i.e. 500,000 of new EEE and 500,000 of used EEE imported into Nigeria

E-Waste Characteristics

The rapidly growing quantity of e-waste and the hazards in e-waste are two primary characteristics which makes e-waste a challenging crisis.

The Health and pollution hazard of e-waste

E-waste contains more than 1000 different substances, many of which are toxic, such as lead, mercury, arsenic, cadmium, selenium, hexavalent chromium, and flame retardants that create dioxins emissions when burned. About 70 % of the heavy metals (mercury and cadmium) in US landfills come from electronic waste. Consumer electronics make up 40 % of the lead in landfills. These toxins can cause brain damage, allergic reactions and cancer (Puckett and Smith, 2002).

Disposal

When e-waste is disposed of or recycled without any controls, there are predictable negative impacts on the environment and human health .E-waste contains considerable quantities of valuable materials such as precious metals. For instance, discarded batteries, air conditioners and refrigerators when dumped in landfills produces hazardous substances like mercury and Chlorofluorocarbon (CFC) which leaches the soil minerals; contaminating and polluting the groundwater in the process (Dipankar, 2009).

Recycling

Most developing countries including Nigeria have neither a well-established system for separation, storage, collection, transportation, and disposal of waste nor the effective enforcement of regulations relating to hazardous waste management (Mundada et al., 2004). They do not have legislation dealing specifically with e-waste, and there is lax enforcement of existing laws dealing with general waste management. Formal recycling of e-waste using efficient technologies and state-of-the-art recycling facilities are rare. As a result electronic wastes are managed through various low-end management alternatives such as disposal in open dumps, backyard recycling and disposal into surface water bodies (Furter, 2004). The main components of interest for recyclers are materials containing copper (wires and cables, CRT yokes), steel (internal computer frames, power supply housings, printer parts), plastics (housings of computers, printers, faxes,

phones, monitors), aluminum (printer parts), printer toners and printed circuit boards. There is no integrated framework regarding the monitoring and management of toxic and hazardous materials and wastes in these countries.

Safety

Emissions from informal recycling activities have already been assessed in many studies (Sepúlveda et al. 2010) and their impacts on the environment (Nnorom et.al 2010) and health are evident. Major impacts from current recycling practices in West Africa result mainly from the processes of dismantling, material recovery and final disposal.

The practices used in developing countries to extract valuable components often exacerbate pollution by creating hazardous chemicals and additional pollution. For instance, open fires burn in relatively low temperatures in comparison with incinerators and the release of pollutants is significantly higher (Mvo Platform & Good Electronics, 2009). Increased levels of polychlorinated biphenyls (PCBs) and polybrominated diphenyl ethers (PBDEs) found in breast milk samples in Accra, Ghana, were also linked to informal e-waste recycling activities (Asante et al. 2011).

Grounding the theoretical model in the context of the Study – Nigeria

The theoretical model has attempted to describe the various issues and concepts that will underpin the study. This section considers the external factors of the context of the study in the form of legislative factors, technical and cultural factors.

Legislative factors

Loewenberg (1995:736) conceptualizes legislatures as “assemblies of elected representatives from geographically defined constituencies, with lawmaking functions in the governmental process”. In the same vein, Jewell (1997) identified two features that distinguish legislatures from other branches of government. He opines that legislatures have formal authority to pass laws, which are implemented and interpreted by the executive and judicial branches and their members normally are elected to represent various elements in the population. Legislative influence over policy range from its initiation and formulation to its implementation, control and review.

The legislature in Nigeria is bicameral at the federal level, unicameral in the states and has the constitutional role to make inputs into public policy such as environmental and e-waste policies (Anam-Ndu 2003). Though the legislatures at the national and state levels legislate on distinct issues, they follow the same procedures. However, where there is a conflict the federal legislature has overriding jurisdiction.

National policy

Under the Nigerian constitution, the federal government is responsible for the overall direction and leadership in policy making planning process from the formulation stage through the implementation and evaluation stages. In a developing nation like Nigeria, public policy is very critical to aid development. In the Nigerian context however, more often than not public policies are made but lack implementation just like some of the environmental policies.

The National Environmental Standards and Regulations Enforcement Agency (NESREA), has the responsibility for the protection and development of the environment, biodiversity conservation and sustainable development of Nigeria's natural resources in general .NESREA is also responsible for environmental technology, including coordination, and liaison with, relevant stakeholders within and outside Nigeria on matters of enforcement of environmental standards, regulations, rules, laws, policies and guideline(Be-nebo,2009).

Economic issues

For emerging economies, material flows from e-waste imports not only offer a business opportunity, but also satisfy the demand for cheap second hand electrical and electronic equipment (Widmer et al., 2005). The e-waste sector provides thousands of people with jobs, in spite of the health and environmental risks the operations pose. In developing countries, e-waste is mainly recovered by informal individual brokers, or street hawkers and then resold to small-scale dismantling plants or household work-sheds for environmentally unsound recycling or disposal, which has provided employment to many labourers. Unfortunately most of the participants in this e-waste management system, motivated by the profits from e-waste recycling and disposal, are not aware of the environmental pollution and health hazards to residents and workers caused by e-waste (Osibanjo O., Nnorom I.C.(2007).

Technical issues

In the developing countries, inappropriate and crude techniques are adopted in material recovery from e-waste. This has four major effects: Low recovery of materials; recovered materials are often heavily contaminated, Crude recovery techniques result in environmental contamination (Sepúlveda et al. 2010), Negative impacts on the health of workers and nearby residents (Schluep et al., 2009).

Widmer et al., 2005 stated that lack of funding, infrastructure and technical skills was a major factor in dealing with the volume of hazardous e-waste in developing countries.

Discussion and Conclusion

This paper provided a synthesis of literature on policy cycle / process, policy types and characteristics, e-waste sources, e-waste characteristics and policy implementation, in order to bring these concepts to bear on the e-waste policy development process in Edo state Nigeria. In particular it was identified that the policy process cycle could be useful in guiding the e-waste policy making process. The work of Griddle and Thomas (1991) on the political economy of reform in developing countries is one from which several other authors quote. Based on an analysis of policy and organizational reform in recent decades from several developing countries, they propose a multivariate framework for understanding the emergence, discussion, implementation and sustainability of policy reform in developing countries. This seems a sensible view of the context of policy development in the e-waste area.

The model presented in this paper is a “sensitizing device” designed to assist thinking about a better policy and implementation process to reduce the dangers and pollution of e-waste in Edo state, Nigeria.

This paper has shown that the lack of suitable e-waste policy and implementation of existing legislation contributing to high level of e-waste waste pollution caused in Edo state, Nigeria.

At the time of writing, the Edo state ministry of environment had no formal policies or strategies that encompassed e-waste; nor do they have a wider green ICT policy or environmental management system. As previously stated, most developing countries, including Nigeria have neither a well-established system for separation, storage, collection, transportation, and disposal of waste nor the effective enforcement of regulations relating to hazardous waste management (Mundada et al., 2004). Edo state does not have legislation dealing specifically with e-waste, and there is lax enforcement of existing laws dealing with general waste management. Formal recycling of e-waste using efficient technologies and state-of-the-art recycling facilities are rare. As a result, electronic wastes are managed through various low-end management alternatives such as disposal in open dumps, backyard recycling and disposal into surface water bodies (Furter, 2004). As such, the development of policy for e-waste in Edo State and other developing country environments remains a challenge.

References

- Adams, D. (2005) review of P. Bridgman and G. Davis *The Australian Policy Handbook*, Sydney, Allen and Unwin, 3rd ed., 2004, *Australian Journal of Public Administration* 62, 1: 102-3
- Anam-Ndu, E. (2003) "Renewing the Federal Paradigm in Nigeria: Contending Issues and Perspectives" in A. T. Gana and S. E. Egwu eds. *Federalism in Africa: Framing the National Question*, Trenton, NJ and Asmara, Eritrea: Africa World Press, pp.47-70.
- Anderson, J. (1975) *Public policy making*. Thomas Nelson and Son Ltd
- Anderson, J. E. (2003). *Public policymaking: An Introduction*. Boston: Houghton Mifflin Company, 2003
- A Fenna. (1998) *Introduction to Australian Public Policy* (Melbourne: Addison Wesley Longman, 3.
- Anderson, G. (2006) 'Ministerial staff: new players in the policy game', in H.K.
- Asante, K. A., Adu-Kumi, S., Nakahiro, K., Takahashi, S., Isobe, T., Sudaryanto, A. and Devanathan, G. (2011). Human exposure to PCBs, PBDEs and HBCDs in Ghana: Temporal variation, sources of exposure and estimation of daily intakes by infants. *Environment International* 37 (5): 921 - 928. doi: DOI: 10.1016/j.envint.2011.03.011.
- Human exposure to PCBs, PBDEs and HBCDs in Ghana: Temporal variation, sources of exposure and estimation of daily intakes by infants. *Environment International* 37 (5): 921 - 928. doi:DOI: 10.1016/j.envint.2011.03.011.
- Bardach, E. (2000) *A Practical Guide to Policy Analysis: the Eightfold Path to More Effective Problem Solving*, New York: Chatham House
- Bridgman, P. and Davis, G. (2003) 'What use is a policy cycle? Plenty, if the aim is clear', *Australian Journal of Public Administration* 62, 3: 98-102
- B Palmer, (1997) "Beyond Program Performance Indicators: Performance Information in a National System of Health and Family Services," in *National Leadership through Performance Assessment*, ed. Department of Health and Family Services Canberra: Department of Health and Family Services, 23-24.
- B W Hogwood and L A Gunn. (1984) *Policy Analysis for the Real World* Oxford: Oxford University Press, 12-19
- Clemons, R.S. and McBeth, M.K. (2001) *Public Policy Praxis: theory and pragmatism: a case approach*, Upper Saddle River NJ, Prentice Hall
- Colebatch, H. K. (2005) 'Policy analysis, policy practice and political science', *Australian Journal of Public Administration* 64, 3: 14-23
- Colebatch, H.K. and Radin, B. (2006) 'Mapping the work of policy' in H.K.Colebatch (ed.) *The Work of Policy: an international survey*, Lanham MD. Lexington Books, pp.
- Colebatch (ed) *Beyond the Policy Cycle: the policy process in Australia*, Sydney, Allen and Unwin, pp. 166-183
- C Ham and M Hill. (1984) *The Policy Process in the Modern Capitalist State* London: Harvester Wheatsheaf, 11.
- C E Lindblom and E J Woodhouse. (1993) *The Policy-Making Process*, 3rd. ed. Englewood Cliffs, NJ: Prentice Hall, 27-30.
- C Shore and S Wright (1997), "Policy: A New Field of Anthropology," in *Anthropology of Policy: Critical Perspectives on Governance and Power*, ed. C Shore and S Wright London: Routledge, 3-35.
- D Easton, (1957). "An Approach to the Analysis of Political Systems," *World Politics*, no. 9
- D Easton, (1965) *A Framework for Political Analysis* Englewood Cliffs, NJ: Prentice-Hall,
- D Easton, (1965) *A Systems Analysis of Political Life* (New York: Wiley.
- D A Stone. (1988) *Policy Paradox and Political Reason* Harper Collins, 7.
- Dittke et al., 2008. How are WEEE doing? A global review of the management of electrical and Electronic Wastes.
- Edwards, M. (2001) *Social Policy, Public Policy*, Sydney, Allen and Unwin
- Fischer, F. (2003) *Reframing Public Policy* Oxford UK, Oxford University Press
- Fischer, F. and Forester, J. (eds) *The Argumentative Turn in Policy Analysis and Planning*, London, Duke University Press/UCL, 10.
- Guba, E.G. and Lincoln, T.S. 1(989) *Fourth Generation Evaluation*, Newbury Park CA, Sage
- G Davis et al., (1993) *Public Policy in Australia*, 2nd. ed. Sydney: Allen and Unwin, 10.
- Hoppe, R. and Jeliaskova, M. (2006) 'How policy workers define their job: a Netherlands case study' in H.K.Colebatch (ed.) *The Work of Policy: an international survey*, Lanham MD.

- Lexington Books, pp. 35-60
- Howard, C. (2005) 'The policy cycle: a model of post-Machiavellian decision-making?'
Australian Journal of Public Administration 64, 3: 3-13
- H K Colebatch. (1998) Policy Buckingham UK: Open University Press, 102-108.
- Howlett and Ramesh, Studying Public Policy: Policy Cycles and Policy Subsystems Hogwood
and Gunn, Policy Analysis for the Real World 19-24.
- I Sharkansky, (1970) "Environment, Policy, Output and Impact: Problems of Theory and Method
in the Analysis of Public Policy," in Policy Analysis and Political Science, ed.
I Sharkansky Chicago: Markham.
- J G March and J P Olsen, Rediscovering Institutions (New York: Free Press, 1989) .
- Lasswell, H.D. (1951) 'The policy orientation', in Lerner, D. and Lasswell, H.D. (eds)
The Policy Sciences, Stanford CA, Stanford University Press
- Lowi, T. J. (1964). 'American Business, Public Policy, Case Studies, and Political Theory',
World Politics 16: 687-91, 713.
- Loewenberg G. (1995) Legislatures and Parliaments in Seymour Martin Lipset 9 ed.
Encyclopedia of Democracy, VOL111, London: Rutledge.
- Majone, G. (1989) Evidence, Argument and Persuasion in the Policy Process, New Haven CT,
Yale University Press
- March, J.G. and Olsen, J.P. (1989) Rediscovering Institutions, New York, Free Press
- Mintzberg, H. (1973) The Nature of Managerial Work, New York, Harper and Row
- Moran, M., Rein, M. and Goodin, R.E. (2006) The Oxford Handbook of Public Policy, Oxford,
Oxford University Press
- M Considine. (1994) Public Policy: A Critical Approach Melbourne: Macmillan, 3.
- M Lipsky, (1980) Street-Level Bureaucracy: Dilemmas of the Individual in Public Services New
York: Russell Sage Foundation, xii.
- Mascarenhas, Government and the Economy in Australia and New Zealand: The Politics of
Economic Policy Making, 221.
- M Howlett and M Ramesh. (1995) Studying Public Policy: Policy Cycles and Policy Subsystems
Toronto: Oxford University Press, 5.
- Myers, M. D. (1997). "Qualitative Research in Information Systems." MISQ Quarterly 21(2): 241-242.
- Nnorom IC, Osibanjo O. 2008. Electronic waste (e-waste): Material flows and management
practices in Nigeria. Waste Management. 28:1472-1479.
- Nnorom, I. C., Osibanjo, O., Okechukwu, K., Nwachukwu, O. and Chukwuma, R. C. (2010).
Evaluation of heavy metal release from the disposal of waste computer monitors at an open dump.
International Journal of Environmental Science and Development, Vol, No3, 227-233, August
2010, ISSN: 2010-0264
- Osibanjo O. and Nnorom I.C., The challenge of electronic waste (e-waste) management in
developing countries. Waste Management & Re-search, 2007. 25(6): 489-501)...
- Patton, C.V. & Sawicki, D.S (1991) Basic Methods of Policy Analysis and Planning, Englewood
Cliffs NJ: Prentice-Hall
- Parsons, W. 1996 Public Policy: an introduction to the theory and practice of policy analysis,
Aldershot UK, Edward Elgar
- P Bridgman and G Davis. (1998) Australian Policy Handbook Sydney: Allen and Unwin, 3.
- Puckett et al., 2002; Brigden et al., 2005; Deutsche, 2007; Cobbing, 2008. A review of the
environmental fate and effects of hazardous substances released from electrical and electronic
equipments during recycling: Examples from China and India
- Radin, B. (2000) Beyond Machiavelli: policy analysis comes of age, Washington DC, Georgetown
University Press
- R C Mascarenhas. (1996) Government and the Economy in Australia and New Zealand:
The Politics of Economic Policy Making Bethesda MD: Austin and Winfield, 1.
- Stewart-Weeks, M. (2006) 'From control to networks', in H.K. Colebatch (ed) Beyond
S Funnell, (1997). "Program Logic: An Adaptable Tool for Designing and Evaluating Programs,"
Evaluation News and Comment 6, no. 1
- The Policy Cycle: the policy process in Australia, Sydney, Allen and Unwin, pp. 184 - 202
- Tao, J. (2006) 'Policy work at the local level in the United State: whispers of rationality', in H.K.Colebatch
(ed.) The Work of Policy: an international survey, Lanham MD. Lexington Books, pp. 181-198
- T R Dye. (1972) Understanding Public Policy, 4th ed. (Englewood Cliffs, NJ: Prentice-Hall, 1.

- UNCTAD (2011) *Measuring the Impacts of Information and Communication Technology for Development*, UN Conference on Trade and Development, Geneva
- W I Jenkins, (1978) *Policy Analysis: A Political and Organizational Perspective* New York: St. Martins Press, 16.
- Tenbenschel, T. (2006) 'Policy knowledge for policy work' in H.K.Colebatch (ed.) *The Work of Policy: an international survey*, Lanham MD. Lexington Books, pp. 199-215
- Walter, J. (1986) *The Minister's Minders: personal advisers in national government*, Melbourne, Oxford University Press
- Weimer, D.L. and Vining, A.R. (2005) *Policy Analysis: Concepts and Practice*, Pearson Prentice Hall, Upper Saddle River NJ: Prentice-Hall
- Widmer et al. 2005 *Global perspectives on e-waste*.

