Stakeholder Analysis as a Tool for Systems Approach Research in HRD

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Abstract

The world is experiencing significant, largely economic and sociotechnical, induced change. These induced changes are meaningful with a function of people taking collective actions around common beliefs. These changes are more than jargon, cliché and hyperbole, and they are effecting major transformations. These transformations will impact on how human resources are developed and we need to be able to forecast its effects. In order to produce such forecasts, HRD needs to become more predictive - to develop the ability to understand how human capital systems and organizations will behave in future. Further development of systems models is required to allow such predictions to be made. Critical to the development of such models will be to understand that linear epistemology cannot be the dominant epistemology of practice and that dynamic complexity of challenges confronted by HRD professionals in their daily research and practice requires a nonlinear epistemology of practice, rather than reductive or linear thinking or processes of normal science. Although the adoption of a systems approach to research in HRD is not novel, methodologies and conceptual approaches underlying it use are not very well developed. In this paper, a stakeholder analysis methodology that was developed as a novel method in conducting systems approach research in human resource development, public policy and agricultural education is described.

Keywords: Complexity, Epistemology, Nanotechnology; Stakeholders, Systems Approach, Workforce

Making a Case for Systems Approach

The world is experiencing significant, largely economic and sociotechnical, induced change. These induced changes are meaningful with a function of people taking collective actions around common beliefs. These changes are more than jargon, cliché and hyperbole, and they are effecting major transformations. These transformations however, should consistently meet the growth expectations of various constituents in an increasingly competitive global marketplace through a kind of leadership that solves complex social, economic, and political problems by leveraging the opportunities of an interconnected world (Holliday, 2013; Scheinfeldt, 2012).

These game changing developments have the dimensions of space and time. An action of a group of people or individual can have a game changing impact in just a particular locality or region; or can have global impact. These transformations will impact on how human resources are developed and we need to be able to forecast its effects. In order to produce such forecasts, HRD needs to become more predictive - to develop the ability to understand how human capital systems and organizations will behave in future.

Further development of systems models is required to allow such predictions to be made. Critical to the development of such models will be to understand that linear epistemology cannot be the dominant epistemology of practice and that dynamic complexity of challenges confronted by HRD professionals in their daily research and practice requires a nonlinear epistemology of practice, rather than reductive or linear thinking or processes of normal science (Yawson, 2013). Central to this will be the use of systems approach in HRD research. A systems approach in which physiognomies of one level in a hierarchy are reconnoitered as emergent properties of processes lower down in the hierarchy (Norris, 2012), will be important for making HRD

predictions in novel conditions. The reason for this is that systems approaches do not assume that the validity of a systems description is interminable (as do phenomenological models by definition), "they rely on the fact that the internal processes will continue to operate into the future and that their operation will be in some way altered by the changed conditions" (Evans, Norris, & Benton, 2012, p. 164). The higher order emergent properties change as a consequence of the shifts in the internal processes not because the higher order effects themselves have been projected into the future (Evans et al., 2012).

Although the adoption of a systems approach to research in HRD is not novel, methodologies and concepts underlying the approach are not very well developed. In a mixed methods study to identify skill needs for agrifood nanotechnology, a comprehensive methodology was developed for a systems approach research in agricultural education, public policy and HRD. In this paper, a stakeholder analysis methodology that was developed as part of a novel method in conducting systems approach research in human resource development is described.

Overview of the Systems Approach Methodology and Conceptual Framework

As stated earlier, a systems approach methodology was developed and used to identify skill needs for agrifood nanotechnology workforce. It was a multi-phase, mixed methods study design (Creswell & Plano-Clark, 2010) based on systems theory and complexity theory. The study followed a four-step process involving different methods and approaches. The first phase marked (1) in the schematic diagram in Figure 1 involved a comprehensive systematic evidence review (SER) and analysis of the literature. This phase of the study also helped to identify key experts, conduct stakeholder analysis, and formulate questions for in-depth and semi-structured interviews. The stakeholder analysis is the subject of discussion in this paper.

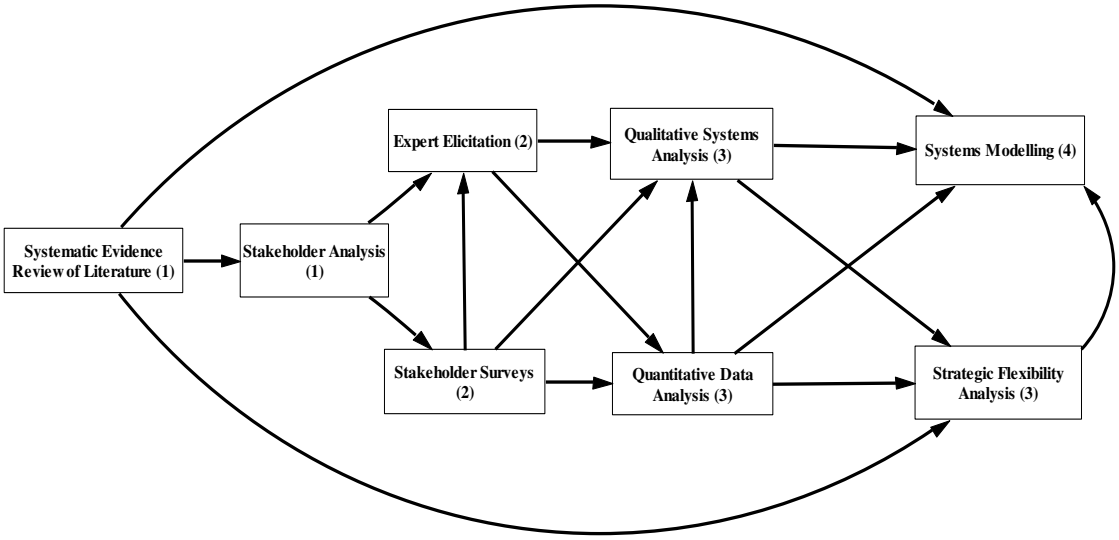


Figure 1. **Schematic Representation of the overall systems approach methodology**

The second phase of the study, marked [2] in the schematic diagram, used multi-criteria approaches for value elicitation including surveys and semi-structured interviews with key stakeholders and experts to identify current and future skill needs in agrifood nanotechnology sector. The third phase of the study (marked [3] in the schematic diagram) included Qualitative Systems Analysis (QSA); Quantitative Data Analysis (QDA); and Strategic Flexibility Analysis (SFA) (a scenario analysis method) of evidence from the literature and results from the multi-criteria value elicitation of experts and stakeholders.

The final phase of the study (marked [4] in the schematic diagram) was the creation of a systems model from the QDA, QSA and SFA to describe holistically the current and future skill needs and the important links, interrelationships and apparent themes and patterns identified in the prior phases. This paper, however, focusses on the stakeholder analysis which was empirically developed as part of the systems approach.

Stakeholder Analysis – A Review

The literature offers a wide variety of definitions as to who is a stakeholder. There is, however, little disagreement on what kind of entity can be a stakeholder (Mitchell, Agle, & Wood, 1997). A stakeholder is an entity who has something to gain or lose through the outcomes of a planning process, project, or policy formulation and implementation; and can be organizations, groups, departments, structures, networks or individuals. Stakeholders include interests groups who are affected by the issue or those whose activities strongly affect the issue; those who possess information, resources and expertise needed for strategy formulation and implementation; and those who control the implementation of the various responses (FAO, 2007).

Stakeholder Analysis (SA), is an analysis tool for assessing different interest groups around a policy issue or intervention, and their ability to influence or be influenced by the final outcome (FAO, 2007). Varvasovszky & Brugha, (2000) described Stakeholder Analysis as: An approach, a tool or a set of tools for generating knowledge about actors – individuals and organizations – so as to understand their behavior, intentions, interrelations and interest; and for assessing the influence and resources they bring to bear on decision-making or implementation process (p. 338).

Schmeer, (1999), described SA as "a process of systematically gathering and analyzing qualitative information to determine whose interests should be taken into account when developing and/or implementing a policy or program"(p.3). Grimble and Wellard, (1997) defined SA from systems perspective as "a holistic approach or procedure for gaining an understanding of a system, and assessing the impact of changes to that system, by means of identifying the key actors or stakeholders and assessing their respective interests in the system" (p.175).

Table 1.
Different Definitions of Who Is a Stakeholder

Source	Who is a stakeholder	Area of research
Bowie, (1988, p. 112)	‘‘without whose support the organization would cease to exist’’	Business management
Bracke, Greef, & Hopster,(2005, p.34)	‘‘…any group or individual who can affect or is affected by the behavior of the system’’	Agrifood Policy
Buanes, et al, (2005, p. 211)	‘‘...any group or individual who may directly or indirectly affect—or be affected—...planning to be at least potential stakeholders.’’	Natural resource management
Clarkson, (1995, p. 106)	‘‘...persons or groups that have, or claim, ownership, rights, or interests in a corporation and its activities, past, present, or future.’’	Business management
FAO, (2007, P.1)	"...a person who has something to gain or lose through the outcomes of a planning process or project."	Agrifood Policy
Freeman, (1994, p. 46)	‘‘can affect or is affected by the achievement of the organization’s objectives’’	Business management
Gass, Biggs, & Kelly, (1997, p. 122)	‘‘...any individual, group and institution who would potentially be affected, whether positively or negatively, by a specified event, process or change.’’	Natural resource management
Grimble & Wellard, (1997, p. 175)	‘‘...any group of people, organized or unorganized, who share a common interest or stake in a particular issue or system...’’	Natural resource management
Montgomery, (1995, p.2)	‘‘...persons, groups or institutions with interests in a project or program.’’	International development
(Roco & Bainbridge, 2007)	“An organization, person, or category of people that has a material interest in a pending policy decision and thus arguably should be involved in some way in the decision process”.	Nanotechnology Policy
Rowlinson & Cheung, (2008, p.613)	“…any individuals or groups which can affect organization or project performance or which are affected by the achievement of the organization’s or project’s objectives.”	Project Management
Schmeer, (1999)	“…are actors (persons or organizations) with a vested interest in the policy being promoted…”	Health Policy
Varvasovszky & Brugha, (2000, p. 341)	‘‘...actors who have an interest in the issue under consideration, who are affected by the issue, or who—because of their position—have or could have an active or passive influence on the decision making and implementation process.’’	Health Policy
Walker, Bourne, & Shelley, (2008, p. 648)	“…individuals or groups who have an interest or some aspect of rights or ownership in the project, and can contribute to, or be impacted by, either the work or the outcomes of the project”	Project Management

SA originated in the fields of management studies and business administration (Brugha & Varvasovszky, 2000), but has found wide applications in political science, engineering, public policy, development studies and environmental studies (Billgren & Holmén, 2008). Billgren and Holmén, (2008) have observed that, depending on the scholar's academic interests; SA can take off in various directions. Walker et al., (2008) argued that these may be influenced by the researcher's ontological position and therefore the researcher at the onset of the analysis should declare what influences his/her perceptions. Stoney and Winstanley, (2001) argued that researchers should first clarify their position with regard to their beliefs and positions on who can be viewed as valid stakeholders so that their biases and chosen ontological perspective are clear.

Stakeholder Theory: Issues and Contentions

In the fields of management studies, business administration, public policy and international development, there has been an explosion of theoretical development over the past several years related in one way or another to stakeholder theory (Buchholz & Rosenthal, 2005). Stakeholder theory was put forward by Freeman (1984) as a proposal for the strategic management of organizations in the late twentieth century. It may be traced back even as far as Adam Smith and his *Theory of Moral Sentiments* (Mainardes, Alves, & Raposo, 2011). Its contemporary use in management literature is attributed to Stanford Research Institute, which introduced the term in 1963 to generalize and expand the notion of the shareholders as the only group that management needed to be sensitive towards.

There has been a great deal of debate and discussion about what "stakeholder theory" really is, albeit the debate is missing in HRD discourse. There has been several schools-of-thought: There are the "no theory" proponents who argue that there is nothing like "stakeholder theory," and that theories are connected sets of testable propositions (Parmar et al., 2010). There

are also those who argue that there is just too much ambiguity in the definition of the central term to ever admit of the status of theory (Sternberg, 1997). Others have suggested that it is an alternative "theory of the firm" (Donaldson & Preston, 1995; Kuhn, 2008; McWilliams & Siegel, 2001; Rowley, 1997). There is also the great divide brought about by the counter argument by Freeman, (1999) on his *divergent stakeholder theory* in response to Jones and Wicks', (1999) *convergent stakeholder theory*.

As dialectic-pragmatists, we do not confine our conceptualization of stakeholder analysis to any of these debates. Our contention, is that stakeholder analysis in research and practice within HRD should be undergirded by a non-linear epistemology and not in the dominant linear epistemological approach in HRD.

Conceptualization of Stakeholder Analysis

Based on the review of literature and the analysis of the various theses undergirding stakeholder theory, the stakeholder analysis conceptualized in this study is a relatively simple analytical tool or approach which follows a 4-step process of Specification, Prioritization, Mapping (Visualization) and Engagement. Depending on the organizational form, project or issue at stake there can be varying sub-stages under each of these four broad steps discussed below.

Stakeholder specification. This is the stage where stakeholders are defined and identified in relation to the specific issue under consideration (FAO, 2007). This stage is extremely important to the success of the analysis (Schmeer, 1999). The stakeholders are identified and then categorized into groups based on defined criteria indicating how they are affected or their influence on the issue under consideration or outcome of the project under consideration (Walker et al., 2008).

Stakeholder prioritization. Time, scope of the project, finances and other resources available to the study or project are the main reasons for this stage of the SA approach. Since these resources are limited, the list of stakeholders to be interviewed must be prioritized (Schmeer, 1999). The stakeholder prioritization is undertaken by considering three factors that can assess the relative importance of stakeholders(Elias, Cavana, & Jackson, 2002; Mitchell et al., 1997; Walker et al., 2008): (1) Power—is the stakeholders' power to influence the issue at stake or study objectives significant or relatively limited? (2) Proximity/Legitimacy—are they directly impacted by the consequences of action or inaction on the issue at stake or the research problem identified? (3) Urgency—what is their stake? Are they prepared to go to any lengths to address the issue at stake with or without other stakeholders? The stakeholders are then rated on each of these three factors on a subjective but relative ordinal scale of 1 – 5 (Walker et al., 2008). The stakeholders can then be clustered into primary and secondary stakeholders (Campbell, 2004) or categorized using different typologies (Mitchell et al., 1997).

Stakeholder mapping (visualization). The data from the first two steps are converted into the Stakeholder Map. The relationships that visualization shows will reflect stakeholders' unique relationships (Walker et al., 2008). Various techniques for mapping of stakeholders exist. The most commonly used methods for analysis or mapping of stakeholders plot the stakeholders on a matrix/grid which has two key attributes of stakeholders as its axes (Mathur, Price, Austin, & Moobela, 2007). There are also some more complex techniques for mapping the stakeholders which include the three-dimensional power/legitimacy/urgency criteria used at the prioritization stage (Mathur et al., 2007; Mitchell et al., 1997).

Stakeholder engagement. This is the step stakeholders are engaged in the issue at stake (Walker et al., 2008). Defining appropriate elicitation protocol requires an understanding of each

stakeholder's degree of influence or how they will be impacted by the actions and inactions on the issue under consideration. Although many examples of stakeholder analysis with a policy orientation exist in the literature, none has been conducted on the HRD research or practice to the best of our knowledge. Inclusion of stakeholders in all aspects of the HRD research and practice has been mentioned in many publications but none actually demonstrate a concrete methodology for performing a stakeholder analysis (Davis, 2007). In developing the methodology, the study followed the 4-step process of Specification, Prioritization, Mapping (Visualization) and Engagement for the stakeholder analysis conceptualized.

The Methodology

Stakeholder Specification

This is the stage where stakeholders were defined and identified in relation to workforce development for the agrifood sector. The study adapted the stakeholder analysis approach developed by Varvasovszky and Brugha, (2000) for the stakeholder specification. Stakeholder specification provided a basic understanding of the social and institutional context in which this study was conducted. This task developed a framework of the agrifood nanotechnology network of stakeholders. This structural approach also supported the subsequent assessment of the agriculture and food stakeholders in regard to their perception of nanoskill needs.

At a general level we separated the stakeholder universe into multiple units of analysis based on Yawson's, (2012) 'Nanoliteracy Quintuple Helix Construct': the public component (stakeholders who see and approach agrifood nanotechnology as scientific inquiry which will ultimately impact everyone), the business [industry] component (stakeholders who approach agrifood nanotechnology as investment/ entrepreneurial opportunity/farm business), the academic component (stakeholders who approach nanotechnology with human capital

development mission), the Third Sector component (stakeholders who advocate for the use and non-use of nanotechnology), and the government [regulatory/ federal] component (stakeholders responsible for economic, ethical, legal, and social, policy). Figure 2 is a diagrammatic representation of this multiple unit of analysis and Table 2 shows the typology used in prioritizing the stakeholders.

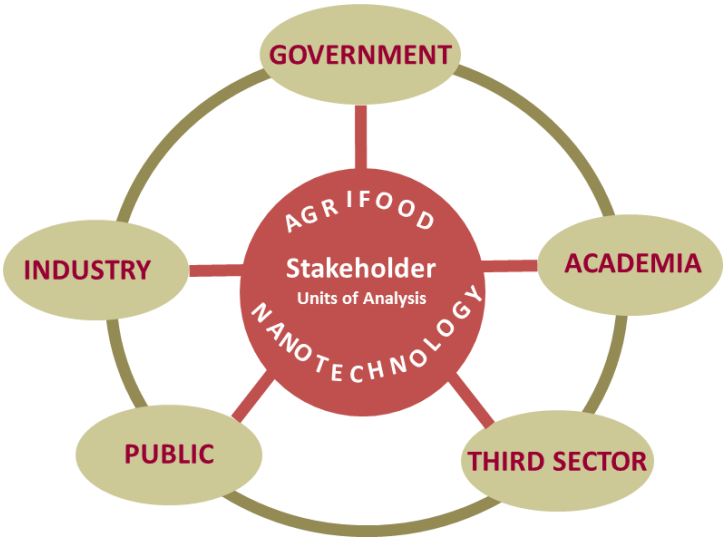


Figure 2. **Agrifood Nanotechnology Stakeholder Unit of Analysis**

The main questions that guided the identification of stakeholders are: Who, in general, are the main stakeholders in the agrifood nanotechnology workforce development network, what are their particular areas of interest, and how they are defining skill requirements for agrifood nanotechnology? Using Varvasovszky and Brugha's (2000) stakeholder analysis matrix and Yawson's, (2012) Nanoliteracy Quintuple Helix Construct, a stakeholder map was constructed. The boundary of each stakeholder cluster was defined, as discussed under the next section on stakeholder specification, and the stakeholders were identified based on the literature.

Table 2.
Framework for Stakeholder Analysis of Agrifood Nanotechnology Skill Needs

Stakeholders	Power	Proximity/Legitimacy	Urgency	Representatives identified for the study (sampling)
Government				
Industry				
Academia				
Public				
Third Sector (NGO's)				

Academia in this stakeholder analysis is not referring to only higher education but as Yawson, (2012) described, it encompasses all levels and forms of education. The constituent stakeholders in the academia unit of analysis were categorized as follows: Institutions offering bachelor degree programs; institutions offering master degree programs; institutions offering doctoral degree programs; institutions offering doctoral TVET/CTE programs; institutions with nanotechnology workforce development programs and infrastructure; institutions with infrastructure and programs for K-12 nanotechnology education; and professional and academic bodies of interest.

As stated earlier government as unit of analysis for the stakeholder study was defined as the regulatory/ federal component of stakeholders responsible for economic, ethical, legal, and social, policy with the goal of making agrifood nanotechnology education policy more rigorous, transparent and scalable. A government entity is any organization that is funded by the government and formed to fulfill the policy of the government in a given area. The constituent stakeholders in the government unit of analysis were categorized into Government laboratories and Centers; and Government Agencies for this study.

The 'third sector' is a collective term for all those organizations that are not-for-profit and non-government, in addition to activities of volunteering and giving which sustain them (Australia and New Zealand Third Sector Research (ANZTSR), 2012). Although there are vast differences among them, third sector organizations are completely different as a group from

government and private (industrial) organizations (ANZTSR, 2012). They are characteristically mission driven and have a tendency to value consensus decision making. In this analysis the third sector stakeholders were advocacy groups and other non-governmental and not for profit organizations directly interested (for or against) the use of nanotechnology in food and agriculture. Industry as a unit of analysis includes all stakeholders in the agrifood nanotechnology sector involved in the agribusiness food chain from farm to fork.

Stakeholder Prioritization

Time, scope of the project, finances and other resources available to the study were the main reasons for this stage of the SA approach. Since these resources were limited, the list of stakeholders to be interviewed were prioritized (Schmeer, 1999). The stakeholder prioritization was undertaken by considering three factors that assessed the relative importance of stakeholders (Elias, Cavana, & Jackson, 2002; Mitchell et al., 1997; Walker et al., 2008). Using the following typology to prioritize them on a scale of 1 (lowest) to 5 (highest) experts were surveyed: (1) Power—is the stakeholders' power to influence skill development in agrifood nanotechnology significant or relatively limited? (2) Proximity/Legitimacy—is the stakeholder directly impacted by the consequences of action or inaction on the issue at stake i.e. skill needs for agrifood nanotechnology? (3) Urgency—what is their stake? Is the stakeholder prepared to go to any lengths to address the issue at stake with or without other stakeholders? The stakeholders were then rated on each of these three factors on a subjective but relative ordinal scale of 1 – 5 (Walker et al., 2008) by the experts.

Stakeholder Mapping (Visualization)

The data from the first two steps were converted into the Stakeholder Map. The relationships that visualization shows reflect stakeholders' unique relationships (Walker et al., 2008).

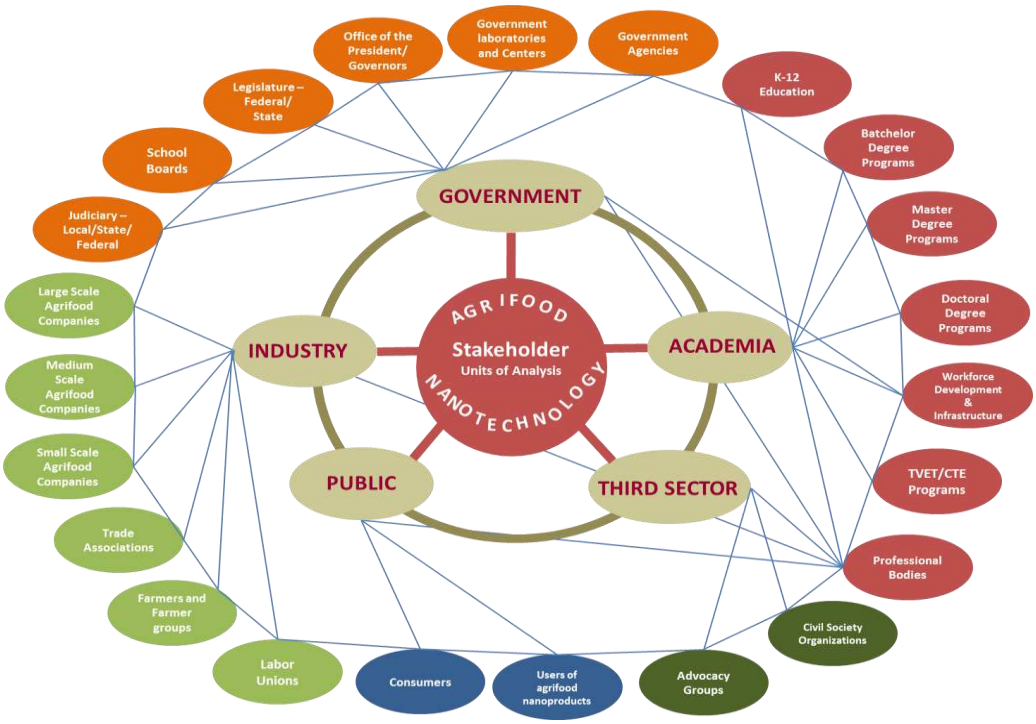


Figure 3. **Specifications of the First Phase of Stakeholder Analysis**

Stakeholder Engagement

This is the step stakeholders were engaged in the issue at stake (Walker et al., 2008). Various stakeholder groups were surveyed. Defining appropriate elicitation protocol requires an understanding of each stakeholder's degree of influence or how they will be impacted by the actions and inactions on the issue under consideration.

Results of Stakeholder Analysis

Stakeholders in the agrifood system are wide ranging depending on the issue of concern. In the study, the stakeholders identified were those who have direct interest in or influence over

workforce development in the agrifood sector. The first phase of the stakeholder analysis resulted in the specifications shown in Figure 3 and also listed in Table 3.

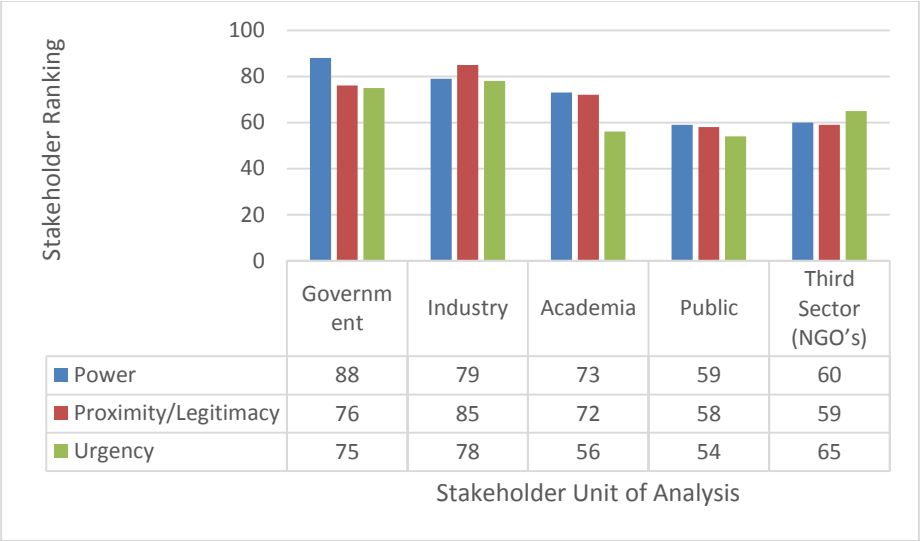
Table 3.
Agrifood Nanotechnology Stakeholder Analysis

Stakeholder Unit of Analysis	Stakeholder Representatives
Academia	Institutions with infrastructure and programs for K12 nanotechnology Education; Institutions offering TVET/CTE certificate Programs; Institutions offering Bachelor Degree Programs; Institutions offering Master Degree Programs; Institutions offering Doctoral Degree Programs; Institutions with Nanotechnology Workforce Development Programs and Infrastructure; Professional and Academic Bodies of interest e.g. AAAE; IEEE; AHRD etc.
Government	Government (National) Laboratories and Centers Government Agencies e.g. FDA, USDA, USDL etc. Office of the President/Governors Legislature – Federal/State Judiciary –Local/State/Federal School Boards
Industry/Business	Large Scale Agrifood Companies Medium Scale Agrifood Companies Small Scale Agrifood Companies Trade Associations e.g. Chamber of Commerce Farmers and Farmer groups and Associations Labor Unions
Public	Consumers Users of agrifood nanoproducts
Third Sector	Advocacy Groups Civil Society Organizations

Results of the study

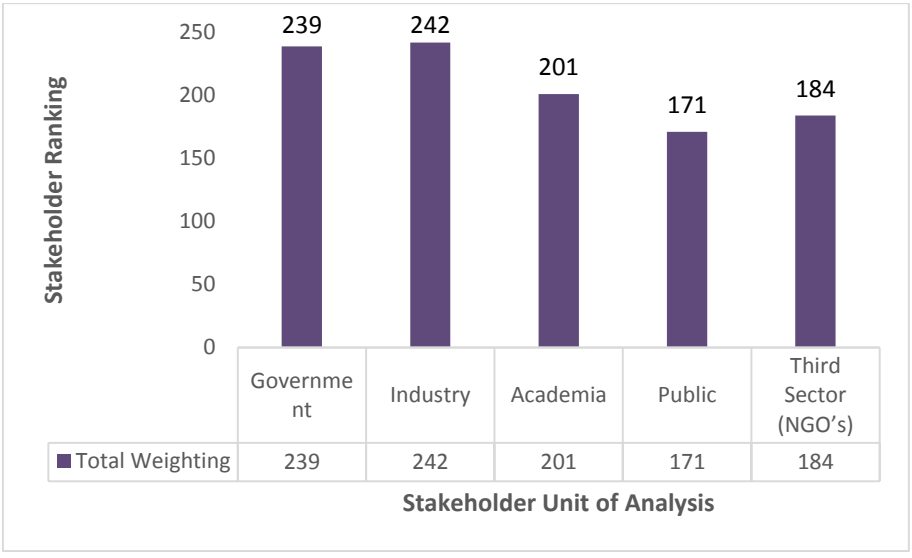
In answering the research question for the study "who are the key stakeholders in the agrifood nanotechnology sector? Experts were made to use the following typology to prioritize the stakeholder specification as shown in Table 3 on a scale of 1 (lowest) to 5 (highest): (1) ***Powe***r—is the stakeholders' power to influence skill development in agrifood nanotechnology

significant or relatively limited? (2) ***Proximity/Legitimacy***—is the stakeholder directly impacted by the consequences of action or inaction on the issue at stake i.e. skill needs for agrifood nanotechnology? (3) ***Urgency***—what is their stake? Is the stakeholder prepared to go to any lengths to address the issue at stake with or without other stakeholders? The results obtained are shown in Figures 4 - 6.



	Government	Industry	Academia	Public	Third Sector (NGO's)
Power	88	79	73	59	60
Proximity/Legitimacy	76	85	72	58	59
Urgency	75	78	56	54	65

Figure 4. **Stakeholder Prioritization by Experts**



	Government	Industry	Academia	Public	Third Sector (NGO's)
Total Weighting	239	242	201	171	184

Figure 5. **Cumulative Ranking of Stakeholders**

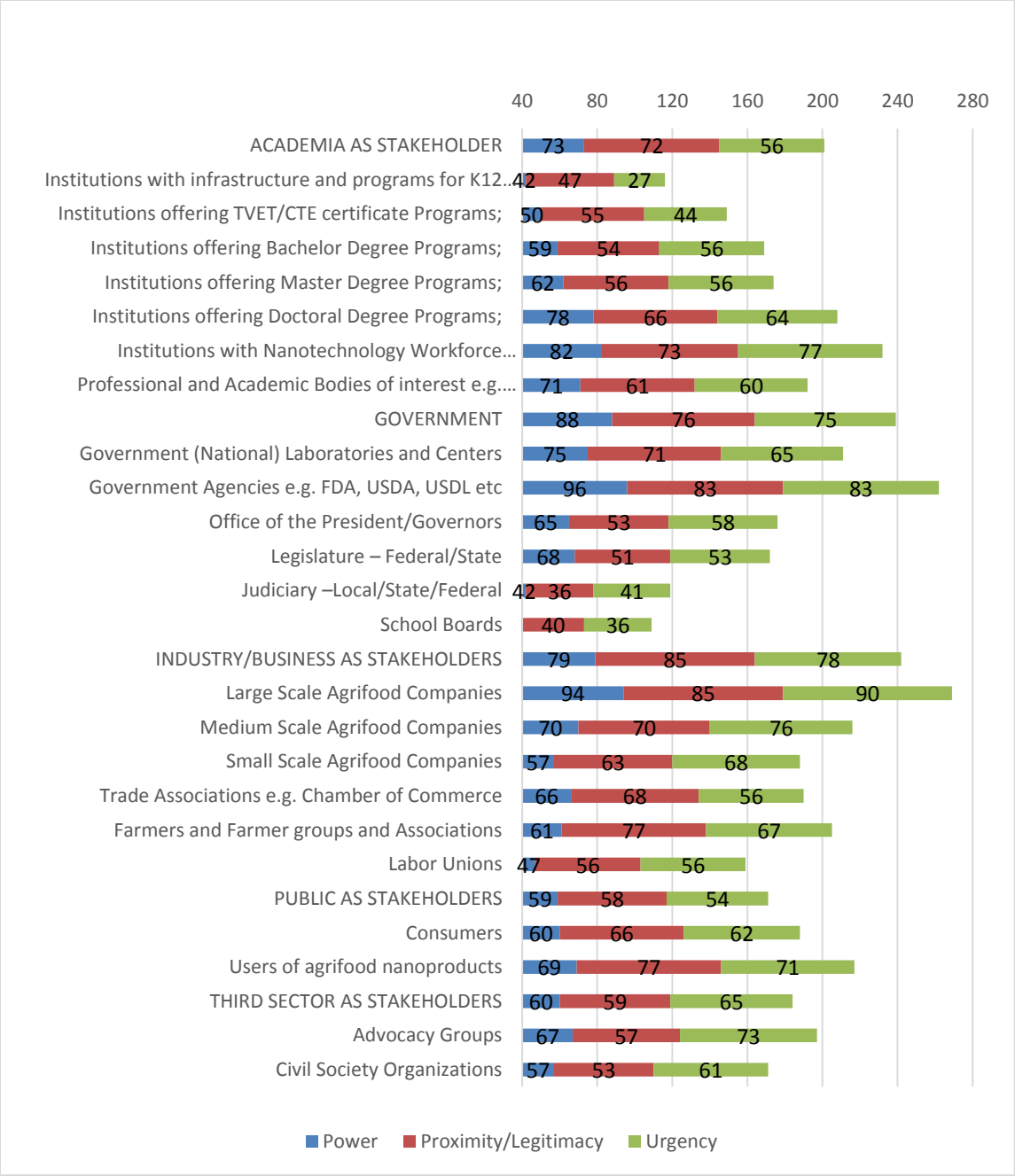


Figure 6. **Prioritization of Stakeholder Representatives**

In an attempt to answer the related research question of who the stakeholders in agrifood nanotechnology workforce development are, and their perception of skills shortages and gaps in the sector, interesting results were obtained. Experts identified large scale agrifood companies; government agencies (FDA, USDA, EPA etc.); institutions with nanotechnology workforce

development; and, users of agrifood products, as the most important stakeholders in that order. Several stakeholders identified through the SER were also highly ranked. However, Experts did not find the Judiciary and School Boards as important stakeholders although in the literature school boards were identified as important stakeholders. This present an interesting finding for HRD research as it empirically portrays the relevant target audience of our research.

The Use of the Results in the Overall Systems Approach

Having identified and prioritized the stakeholders, the study used multi-criteria approaches for value elicitation including surveys and semi-structured interviews with the key stakeholders and experts to identify current and future skill needs in agrifood nanotechnology sector. As part of the overall systems approach, Qualitative Systems Analysis (QSA); Quantitative Data Analysis (QDA); and Strategic Flexibility Analysis (SFA) (a scenario analysis method) of evidence from the literature and results from the multi-criteria value elicitation of experts and stakeholders were done and used to create a systems model to describe holistically the current and future skill needs and the important links, interrelationships and apparent themes and patterns identified in the prior phases.

Implications and Relevance for HRD Research

This study provides a template and research approach that can be adapted and used in HRD practice and research. "Systems theory as foundational theory in HRD is broadly accepted, however, its relevance and use in the practice of HRD remains a myth" (Yawson, 2013, p. 70). To make HRD more predictive, there is the need for a systems approach to research and practice and stakeholder analysis is one key tool to any systems modelling. HRD has several constituencies and a multidisciplinary field of practice and therefore requires that all stakeholders are brought in towards a holistic approach to practice and research. As Garavan (1995) stated:

"Fundamental to the effective management of a strategically focused HRD function is consideration of its key stakeholders." (p. 46). As this study has illustrated, stakeholders will have varying degrees of power, predictability and interest in the HRD research and practice. The HRD professional's duty is to be able to effectively identify the relevant stakeholders and formulate these different perspectives into acceptable HRD strategies. This study has shown how this Stakeholder Analysis Framework can play an important role in helping all members of an organization understand the role their stakeholders play in organizational effectiveness (Kennon, Howden, & Hartley, 2009). We believe that the tool can be quite flexible in how it is used to produce a variety of outcomes to suit any organizational form.

In line with this, there is also the need to re-conceptualize HRD in the context of the rise in the substance of complexity theories and fully acknowledge that there is a parallel outlook and conversation that needs to take place within the field (Iles & Yolles, 2003;Yawson, 2013; Yorks & Nicolaides, 2006) and that stakeholder analysis is a composite part of any such conversation.

Conclusion

We believe that this paper provides a useful framework for using stakeholder analysis as a research methodology in HRD. The review of stakeholder analysis literature has also position the work of key authors within the stakeholder debate and we believe it may provide a more coherent basis for future research and practice. The Stakeholder Analysis Framework described in this paper, has been designed to be flexible in its application, allowing for continuous improvement of the process.

The underlying thesis of this paper has been that the usefulness of linear epistemology and the hard systems approach towards research and practice in HRD is not in contention. The contention is that linear epistemology cannot be the dominant epistemology of practice and that

dynamic complexity of challenges confronted by HRD professionals in their daily research and practice requires a nonlinear epistemology of practice, rather than reductive or linear thinking or processes of normal science(B. E. Jayanti, 2011; E. B. Jayanti, 2011; Yawson, 2013). Systems approach undergirds the nonlinear epistemological orientation and stakeholder analysis is an important component of the systems approach.

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