ISSN: 2524-1354 (Online), ISSN: 2519-7851 (Print)
Africa Habitat Review Journal
Volume 15 Issue 1 (September 2021)
http://uonjournals.uonbi.ac.ke/ojs/index.php/ahr

# Value Chain Framework for Ascertaining Planning Sectors and Competencies

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Received on 7th July, 2021; Received in revised form 5th September, 2021; Accepted on 20th September, 2021.

**Abstract**

*Studies that address the deeply rooted uncertainty in identifying planning sectors and profiling required competencies in preparing plans, especially in the urbanization sector (US), are scanty. This is due in part to the lack of concerns for the effectiveness of the plans and competencies of the planners. The value chain (VC) model was appraised to provide a framework for ascertaining relevance and accuracy of planning sectors and concurrence with required competencies. Data on planning sectors and required competencies was collected at five stakeholder consultative fora, 23 key informant (KI) institutions and seven working sessions. The framework of the model facilitated analyzing the data through disaggregation. The urbanization sector (US), which is the main primary activity (MPA) in the model, was assigned the role of the main planning sector (MPS) and expressed as "MPS:US" in the urbanization value chain. MPS:US was disaggregated into four planning sectors in the value chain, and each sector ascertained through disaggregation from level 1 to 3. It was found that the structure of the model and its function provide appropriate framework for ascertaining relevance and accuracy of planning sectors, and also concur with competencies that are similarly ascertained. Second, the two expressions for disaggregation to ascertain planning sectors and required competencies each respectively combine into one expression for simultaneous disaggregation. The paper concludes that the structure and function of VC model and the expression for simultaneous disaggregation provides a framework of methodology for systematic ascertaining of planning sectors and competencies, and allows variation of number of planning sectors any one value chain represents. The paper recommends adopting the structure and functions of the VC model, and the expression for simultaneous disaggregation as a framework for ascertaining planning sectors and competencies, starting with the conduct of planning studios in the training of planners.*

**Keywords:** Ascertaining, Competency, Profiling, Disaggregation, Planning sectors.

## INTRODUCTION

Studies that address deeply rooted uncertainty in identifying planning sectors and profiling required competencies for preparing plans, especially in the urbanization sector (US) are scanty. This is due in part to the lack of concerns for the effectiveness of the plans and competencies of the planners. Certainty about planning issues and competencies of the planners are in large part guesswork in the absence of systematic ascertaining of the planning sectors and required competencies. The role of planning in creating livable human habitat conditions, conflict-free resource use, and as well, deploying human capital to make planning work, especially in Africa's urbanization sector therefore, remains a mere wish (Barnett and Parnell, 2016). Statutory zoning guidelines for administering development control and inspection of buildings to ascertain adherence to local planning and development requirements, for example, are inadequate. They fall short of accounting for dynamic nature of the wide range of policy areas and diverse issues that characterize planning sectors and required competencies in the public sphere (Rauchfleisch, 2017).

A planning sector is a spatially differentiated tract of economic, social, infrastructure, or environment that is identified based on uniform criteria for development operation (Kenton, 2020). Cotterell (2021), suggest uncertainty and fluxes in planning, diverse contexts and scopes of planning require sensitive criteria for ascertaining the planning

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sector(s) to serve two purposes. The first is preparing single-issue sector plan. Here a sector performs the role of technical instrument for explaining and justifying budget lines as well as organizing information that is used to formulate a single-issue plan – be it infrastructure, economic, social or environment sector plan. Second, a planning sector serves a transitory function by packaging phenomena into levels of multiple strategies, tactics, operations, and sites of development action. The outcome of the second purpose of a planning sector is compiled into intended multiple sectors formal public plan.

This paper is about application of the framework of value chain (VC) model in ascertaining the relevance and accuracy of planning sectors and concurrence with competencies, building on its application in Skills Audit in Urbanization Sector in Rwanda (Rwanda, 2017).

## THEORY

The Government of Rwanda embarked on implementing a strategy to stimulate urbanization from 16.5% in 2012 to 35% by 2020 and over 70% by 2050 along four tracks (Rwanda, 2015a, 2020a). First, six towns were upgraded to secondary city destinations of future rural to urban migrants, centres of investment, and hubs of technology innovation (Rwanda, 2015b). The second is fostering a low carbon urban system to achieve urban environmental sustainability. Implementing green growth, climate resilience and low carbon development strategy along the national roadmap for green secondary city development will anchor the system (Rwanda, 2011; Rwanda and GGCI, 2015). The national spatial development framework will connect urban policy and local planning to catalyze the process of urbanization in the third track (Rwanda, 2015b; Spaliviero et al., 2019). Lastly, local development plans and Rwanda's national master plan will inform urban and rural spatial land uses for smart agglomeration of cities, densification, and clustering of rural settlements (Rwanda, 2020b). However, planning competencies for deliberate urbanization were lacking. The National Skills Audit found a 40% existing capacity gap; but failed to disaggregate and profile required competencies along relevant planning sectors (Rwanda, 2009; Kibuka, 2019).

The sector skills audit utilized the framework of the VC model to address the shortcoming of the national audit in ascertaining relevance and accuracy of planning sectors and concurrence with required competencies (Rwanda, 2017). Williams (1977), defines a framework as the basis of supporting processes. Nielsen (2015), combined physical attributes, processes and organizational principles governing interactive relations to define framework as a supportive structure, rules, ideas and beliefs. This definition is inferred in the VC model as the framework for ascertaining planning sectors and competencies in this paper.

### Framework of Value Chain Model

Porter (1985), developed the VC model as a systematic inter-relation of two sets of activities in creating products. The structure of the model is a framework that define and organize chains of business value prepositions into activities a company undertakes to create value in products and services (Porter, 1985). The activities are organized into primary and secondary activities, with the latter catalyzing productivity of primary activities (Smit, 2010). Primary activities add value and create organizational competitiveness. **Figure 1** presents Porter's original model of five primary activities: inbound logistics, operations, outbound logistics, marketing, and services; and four secondary activities: procurement, technology, human resource management, and physical infrastructure.

Four factors predispose the VC model as a framework. The first is its physical structure providing specific organizational positions for secondary and primary activities in the structure. Second, the profit margins represent outputs as a factor of intra- and inter-activity interactions. The interactions of the two sets of activities is the third factor, while the fourth is the role of the model as a framework of a methodology that has combined first, second and third factors.

### Planning Methodology Gaps in TRPM Framework

Arguably, gaps in the methodology of preparing plans stem from age-old premise that the technocratic rational planning model (TRPM) binds knowing, understanding and human action (Alexander, 2000).

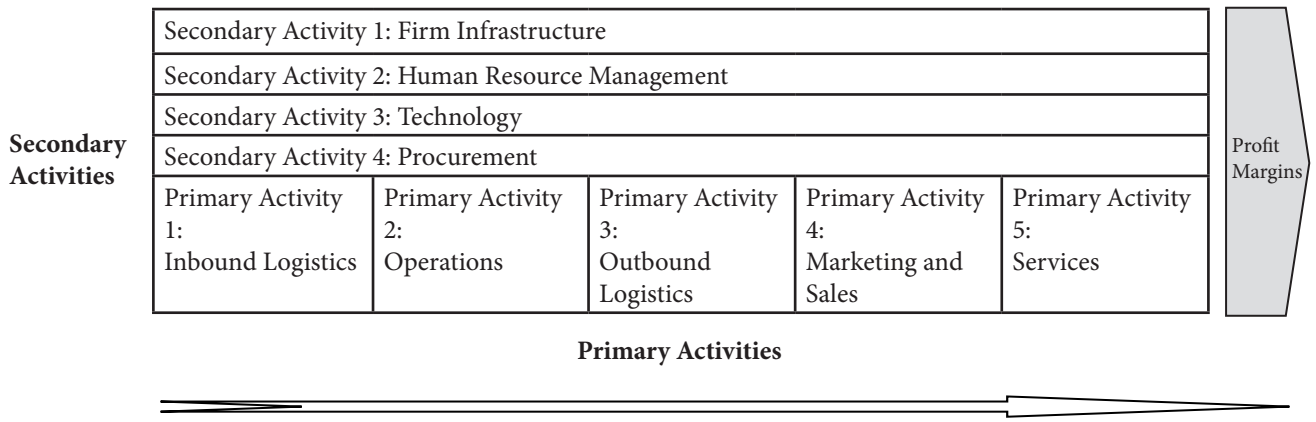


**FIGURE 1**
Value chain model
**Source:** Modified from Porter 1985

True, during sixty-seven years from 1923 launch of the first professional degree program in city planning at Harvard University heralding modern planning, to John Friedmann political community-based definition of planning as link of knowledge to action in 1987; TRPM matured in its service to liberal capitalist market economy (Friedmann, 1987). Meanwhile, planners celebrated the elaborate steps of TRPM, arguing the loop that guide retracing identification of planning problem in light of new realities in the steps of the planning process heralded classical era of TRPM (Calhoun, 1998).

Two waves of intellectual reforms deifying the era played out between 1955 and 1980 to sensitize planners on orthogonal principles of the TRPM. First, the short-lived systems theory would make planning a dynamic scientific and technical undertaking, resting on assumptions that there is consensus on social goals of planning. The utility of instrumental knowledge in transformation of society overrides other forms of knowledge, and social and political nature of planning do not count in orthogonal science (Pacchi, 2018). Second, advocacy was later introduced to democratize TRPM by leveraging the political nature of society, premised on planning advances public good. Planners were to train in advocacy skills and address the shortcomings of orthogonal orientation in the discipline and profession of planning (Stramrud, 2017). Geographic information system was also introduced to modernize the use of spatial data. However, the reforms failed to entirely legitimize orthogonal orientation in TRPM. True to linear, step-by-step logic in technocracy, planning remains in large part marooned in pure rationality, even though rationality in planning has, over time, democratized towards the logic of communicative rationality in multiple publics (Niemi, 2005).

Overall, the reforms failed to introduce and embed a framework for ascertaining issues in planning sectors and profiling the required competencies (Alweendo, 2017). The methodological challenge in the national audit that the sector skills audit sought to address is inherent in TRPM. Specifically, shortcomings of national audit lay in the absence of a framework for disaggregating planning sectors and profiling planning competencies that create the basis for organizational principles and decision-making. Yet, disaggregation performs two roles: matching budget with financial spending in line with policies that drive funding of programs and projects; and identifying priority policy area(s) and specific local site(s) of development activity.

## Competency in Planning

Schultz (1961), suggested knowledge and skills capitalize the ability to perform tasks at the workplace with education and training enhancing the acquired human capital. Ability to acquire information and new ideas, as well as health of individuals, makes concepts of knowledge and skill the centerpiece of defining competency (Becker, 1993). Athey and

Orth (1999), pointed out that competency is a set of observable performance dimensions, including individual's knowledge, skills, attitudes, and behavior, as well as collective team, process, and organizational capabilities that are linked to high performance, and provide the organization with a sustainable competitive advantage.

Hoffman (1999), observed competency is acquired from curricula-based education and training, as well as inherent personal characteristics that predispose an individual to a level of ability to perform a task. Personal characteristics include: state of mind, intellect, emotion and attitude, social and cognitive power. These operationalize functional capabilities against set criteria for certifying competency in academic knowledge and skills. Ennis (2008), has summarized competency as the capability of applying the use of knowledge, skills, abilities, behavior and personal characteristics to perform critical tasks, specific functions, or operate in a given role or position.

Profiling the competencies against stated objectives and subjects of planning sectors, packages required knowledge and skills for placement in planning job positions.

Guzzetta and Bollens (2003), illustrate concerns for competency in planning for urbanization in their study of 638 planning, planning-related, and non-planning professionals. Communication skills were most valued, followed by technical and quantitative skills across the three categories of professionals. Findings by each category show planners valued writing and public communication more than planning-related and non-planning professionals. Planners in the public sector valued writing and communication skills than planners in the private sector. Environment, land use, transportation, and design are the four core areas of the planning profession, while technology, innovations and institutions bear influence on the historical process of urbanization and planning responses to it (Wong, (2020).

## RESEARCH METHODS

Three methods were used to collect data for this paper. The first is stakeholders consultation in form of dialogue. Levers (2021), pointed out that a consultative workshop is an appropriate forum for stakeholders to generate data. Five stakeholder consultative forums were organized (**Table 1**).

Secondly, seven working sessions were organized to analyze data, including appraising the VC model to derive its framework and expression for ascertaining planning sectors and profiling competencies through disaggregation (**Table 2**).

**TABLE 1:** Five stakeholders consultative forums

| Forum in the Series | Type and Objective of Forum | |
|---|---|---|
| | **Type** | **Objective** |
| First | Stakeholders Consultative Meeting | Discuss inception report, the launch of the study, and adopt value chain methodological framework |
| Second | Stakeholders Consultative Workshop | Discuss data needs and collection strategies |
| Third | Stakeholders Validation Workshop | Discuss data analysis |
| Fourth | National Stakeholders Validation workshop | Validation of study findings by experts |
| Fifth | Senior Policy Makers Consultative Workshop | Discuss and adopt a final draft report on "Skills Audit in Urbanization Sector in Rwanda 2017" |

**Source:** Authors 2021

**TABLE 2:** Seven working sessions

| Working Session | Working Session |
|---|---|
| First | Appraisal of Urbanization Sector Policy Issues and Goals |
| Second | First Urbanization Sector Situational Analysis and Identification of Primary and Secondary Activities in Urbanization Sector Value Chain |
| Third | Data Collection Tools and Strategy |
| Fourth | Second Urbanization Sector Situational Analysis |
| Fifth | Review of Data Analysis Results |
| Sixth | Professional/Skills/Occupation Data Analysis |
| Seventh | Final Review of Study Final Report |

**Source:** Authors 2021

Lastly, key informant interviews were conducted to administer questionnaires to 23 urbanization specialist key informant respondents, each representing their respective stakeholder institutions as source of data on required competencies. Fifteen or 65.2% of the respondents were on demand side of required competencies. Eight respondents representing 53.3% of the fifteen, and accounting for 34.8% on demand side, were central government and secondary city institutions, underlining the importance of central government in planning. The other eight, or 34.7% respondents of the total, including University of Rwanda and six integrated regional polytechnic centres, are on the supply side.

## RESULTS

**Figure 2** presents the results of appraising the VC model to derive its structural, primary, and secondary activity parameters as a framework for ascertaining sectors and competencies. Dummy variables of the parameters representing an infinite number of activities, namely, "Primary Activity 1", to "Primary Activity ... J"; and "Secondary Activity 1", to "Secondary Activity …N" were inserted to map the parameters in the structure and confirm suitability of the framework. The "outcomes" also representing an infinite combination of "1, … J secondary activities" and "1, … N primary activities" replaced "profit margins" in the model. Potential for replacement and substitution of the parameters confirmed the model is flexible, versatile and, therefore, suitable for disaggregating pairs of co-relating activities beyond business to other social sciences, including planning.

### Disaggregation of Planning Sectors

Urbanization sector (US) was identified as the main primary activity, ascertained as the main planning sector (MPS) and serialized as MSP: US in the urbanization value chain. Disaggregation of MPS: US ascertained four core planning sectors, namely: planning, coordination, and budgeting (PCB); strategic urban environment and social management (SUESM); infrastructure and utilities (IU); and urban services and special initiatives (USSI). Each sector is a core area of knowledge and skills, representing a value predisposition in the urbanization sector. It also reflects value predisposition of required competencies that are profiled around the four categories of competency: specialist, professional, technician, and artisan.

The four core planning sectors were serialized as First Primary Planning Sector (FPS): PCB, Second Planning Sector (SPS): SUESM, Third Planning Sector (TPS): IU, and Fourth Planning Sector (FPS): USSI. The four sectors, together with the four categories of competencies, were mapped in the framework of the VC model to form a basis of disaggregation of the sectors and competencies (**Figure 3**). A common expression for presenting the sectors along the urbanization value chain was developed in two stages to make application of the framework explicit in guiding systematic disaggregation and profiling.

First, letter "F" for First, "S" for Second, and "T" for Third and "F" for Fourth, and so on; were replaced with respective numerals. The model was changed so

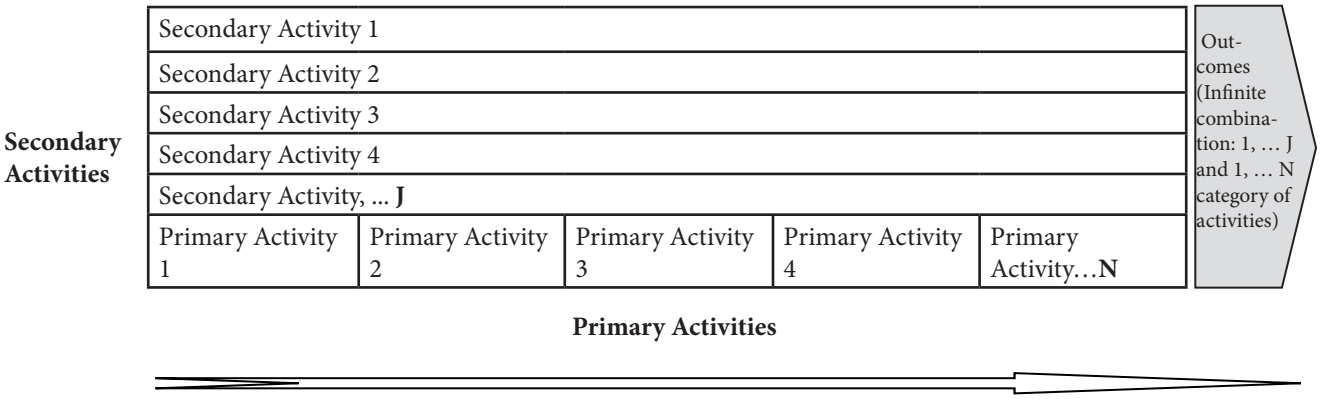


**FIGURE 2**
Physical structure and dummy parameters for primary and secondary activities mapped in the framework of VC model
**Source:** Authors 2021

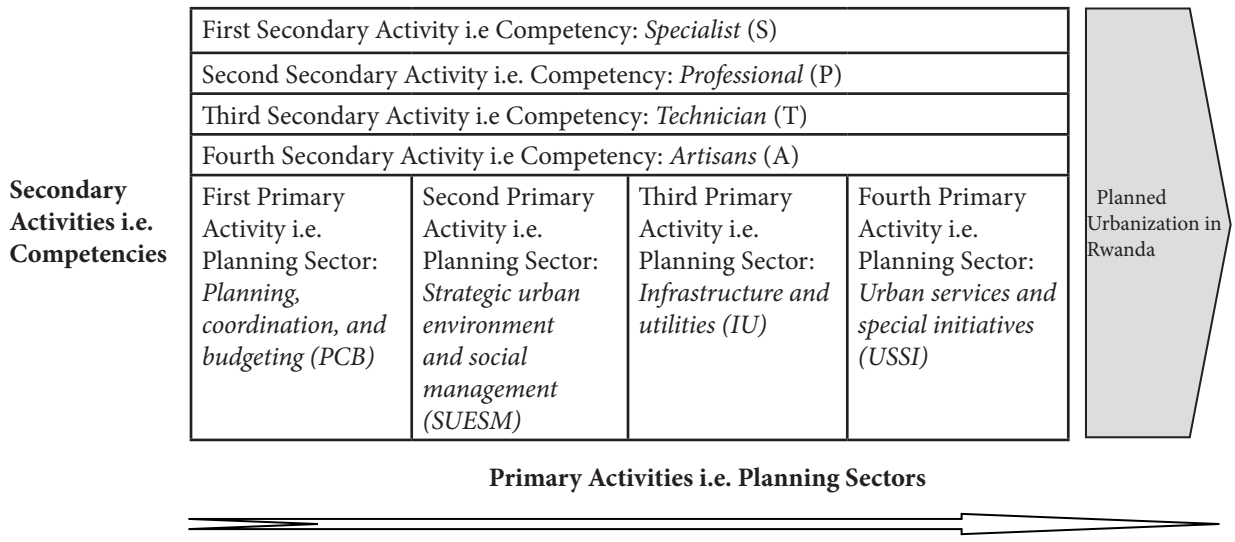


**FIGURE 3**
Planning sectors and categories of competencies in the urbanization sector mapped in the framework of VC model
**Source:** Authors 2021; Rwanda 2017

that FPS: PCB is 1st PS: PCB, SPS: SUEM is 2nd PS: SUEM, TPS is 3rd PS: IU, and FPS: USSI is 4th PS: USSI. In the second stage, planning sectors were assigned "levels" to serialize respective vertical occurrence of the disaggregated outcomes down urbanization value chain. MPS: US is level one i.e., "level 1 covering the national planning policy, strategy as well as issues, challenges and opportunities in planning for urbanization as the nexus of economic growth, social development and care for the environment. Expression for disaggregation take the form 1st MPS L 1: US. Level two i.e., level 2 ("L 2") planning sectors are presented as 1st PS: PCB, 2nd PS: SUEM, 3rd PS: IU, and 4th PS: USSI. "L 2" was inserted in each to express it as 1st PSL 2: PCB, 2nd PSL 2: SUEM, 3rd PSL 2: IU, and 4th PSL 2: USSI, respectively.

The expression for disaggregation was similarly used to present the four categories of competencies. First Competency Level 1: Specialist, took the form "1st COL 1: Specialist" i.e., 1st COL 1: S; Second Competency Level 1: Professional is "2nd COL 1: Professional" i.e., 2nd COL 1: P; Third Competency Level 1: Technician is "3rd COL 1: Technician" i.e., 3rd COL 1: T; and Fourth Competency Level 1: Artisan is "4th COL 1:

Artisan" i.e., 4th COL 1: A. **Table 3** presents levels and expressions for disaggregation of planning sectors and competences.

**Profiling of Competencies**

Twenty-three level 2 competencies were ascertained through profiling into jobs/ knowledge and skills they represent in each of the four planning sectors. Percentage proportions of the profiled competencies are 1st PSL 2: PCB, 3rd PSL 3: IU and 4th PSL 3: USSI each at 26.1% of the total core jobs with remaining 21.7% in 2nd PSL 2: SUESM (**Table 4**).

The results in **Table 4** were organized into the nine level 3 planning sectors in **Table 5**. The highest proportion of the profiled competencies is 17.4% for 3rd PSL 3: U covering 1st COL 2: DUBS, 1st COL 2: DGSQAUB, 1st COL 2: ASUI and 1st COL 2: DUTITF. **Table 5** also shows 1st COL 2: ANLCMGP, 1st COL 2: UG/PRCA, 1st COL 2: PRDTS, 1st COL 2: PSICP accounting for another 17.4%. PRDTS and PSICP are noted for needs in "research, product development, and innovation and technology service"; and "promoting social inclusion and cultural preservation" competencies, respectively. The second-highest is 13.0% and is distributed in 1st PSL 2: P and include 1st COL 2: DPPS, 1st COL 2: FPP, and 1st COL 2: AP; and 2nd PSL 2: C with 1st COL 2: CIMDP, 1st COL 2: AECDCS and 1st COL 2: MULUSC.

**Criteria for Ascertaining Planning Competencies through Profiling**

The 23 level 2 competencies were further disaggregated through profiling against academic and functional occupation competency criteria. The profiling happened vertically within each category to ensure auto-correlation of the ratio of jobs i.e., industry-specific competencies. The results were then mapped in the four level 1 categories of competency. It was noted the ratio of planning specialists (PS), to professional planners (PP), to planning technicians

**TABLE 3:** Summary of levels and expressions for disaggregation

| **Planning Sector** | **Levels and Expression for Disaggregation** | |
|---|---|---|
| | **Level of disaggregation** | **Abbreviated expression** |
| Main Planning Sector: Urbanization Sector (US) | Level 1 | 1st MPS L 1: US |
| First Planning Sector: Planning, Coordination, and Budgeting (PCB) | Level 2 | 1st PSL 2: PCB |
| Second Planning Sector Level 2: Strategic Urban environment and Social Management (SUESM) | Level 2 | 2nd PSL 2: SUEM |
| Third Planning Sector Level 3: Infrastructure and Utilities (IU) | Level 2 | 3rd PSL 2: IU |
| Fourth Planning Sector Level 4: Urban Ser-vices and Special Initiatives (USSI) | Level 2 | 4th PSL 2: USSI |
| **Category of competency** | **Level of category*** | **Abbreviated expression for disaggregation** |
| First Competencies Level 1: Specialist | Level 1: Specialist | 1st COL 1: S |
| Second Competencies Level 1: Professional | Level 1: Professional | 2nd COL 1: P |
| Third Competencies Level 1: Technician | Leve 1: Technician | 3rd COL 1: T |
| Fourth Competencies Level 1: Artisan | Level 1: Artisan | 4th COL 1: A |

** Competencies were first presented as four categories all in level 1 against planning sectors in level 2. Subsequent sectors are disaggregated through profiling following established competency criteria to come up with specific occupational jobs in the urbanization value chain*

**Source:** Authors 2021

**TABLE 4:** Distribution of the twenty-three jobs/ knowledge and skills in the four planning sectors level 2

| Planning Sectors Level 2 | Profiled Planning Job/ Knowledge and Skills Level 2 | | No | % |
|---|---|---|---|---|
| | Full name | Expression of disaggregation | | |
| 1st PSL 2: PCB | 1. Developing of policies, strategies, plans, and standards (DPPS)<br>2. Formulating and preparing plans (FPP)<br>3. Approving plans (AP)<br>4. Coordinating implementation of master develop-ment plans (CIMDP)<br>5. Administration of enforcing compliance with development control standards (AECDCS)<br>6. Monitoring urban land-use changes (MULUSC) | 1st COL 2: DPPS<br>2nd COL 2: FPP<br>3rd COL 2: AP<br>4th COL 2: CIMDP<br>5th COL 2: AECDCS<br>6th COL 2: MULUSC | 6 | 26.1 |
| 2nd PSL 2: SUESM | 1. Managing encroachment of wetlands, riparian reservations, and ecologically sensitive areas and sites (MEWRRESAS)<br>2. Monitoring and controlling encroachment on forest areas (MCEFA)<br>3. Implementing green urban economic development programs and projects (IGUEDPP)<br>4. Densification of urban land-use (DULU)<br>5. Conducting social impact assessment (CSIA) | 7th COL 2: MEWRRESAS<br>8th COL 2: MCEFA<br>9th COL 2: IGUEDP<br>10th COL 2: DULU<br>11th COL 2: CSIA | 5 | 21.7 |
| 3rd PSL 3: UI | 1. Designing urban buildings and structures (DUBS)<br>2. Developing guidelines/ standards for quality assurance for urban buildings and structures (DGSQAUB)<br>3. Approval and supervision of urban infrastructure (ASUI)<br>4. Designing urban transportation infrastructure and terminal facilities (DUTITF)<br>5. Designing water supply and sanitation facilities, quality assurance (DWSSFQA)<br>6. Designing and supervising energy infrastructure and services, quality assurance, and standards of services (DSEISQASS) | 12th COL 2: DUBS<br>13th COL 2: DGSQAUB<br>14th COL 2: ASUI<br>15th COL 2: DUTITF<br>16th COL 2: DWSSFQA<br>17th COL 2: DSEISQSS | 6 | 26.1 |
| 4th PSL 3: USSI | 1. Promoting economic growth and business support (PEGBS)<br>2. Promoting quality of life and security (PQLS)<br>3. Administering national and local city/municipal government policies (ANLCMGP) | 18th COL 2: PEGGBS<br>19th COL 2: PQLS<br>20th COL 2: ANLCMGP<br>21st COL 2: UG/PRCA | 6 | 26.1 |

| | | | | |
|---|---|---|---|---|
| | 4. Urban governance (Public relations and corporate affairs) (UG/PRCA)<br>5. Research, product development, and innovation and technology service (RPDITS)<br>6. Promoting social inclusion and cultural preservation (PSICP) | 22nd COL 2: PRDTS<br>23rd COL 2: PSICP | | |
| **Total** | -- | | **23** | **100.0** |

**Source:** Authors 2021

**TABLE 5:** Distribution of the twenty-three jobs/ knowledge and skills in nine planning sectors level 3

| **Planning Sectors Level 3** | **Profiled Planning Job/Knowledge and Skill Level 2 Sectors** | | **No** | **%** |
|---|---|---|---|---|
| | **Full name** | **Disaggregation expression** | | |
| **1st PSL 2: PCB** | | | | |
| 1st PSL 3: C, of 1st Sector | 1. Developing of policies, strategies, plans, and standards (DPPS)<br>2. Formulating and preparing plans (FPP)<br>3. Approving plans (AP) | 1st COL 2: DPPS<br>2nd COL 2: FPP<br>3rd COL 2: AP | 3 | 13.0 |
| 2nd PSL 3: C, of 1st Sector | 1. Coordinating implementation of master development plans (CIMDP)<br>2. Administration of enforcing compliance with development control standards (AECDCS)<br>3. Monitoring urban land-use changes (MULUSC) | 4th COL 2: CIMDP<br>5th COL 2: AECDCS<br>6th COL 2: MULUSC | 3 | 13.0 |
| 3rd PSL 3: B, of 1st Sector | None (budging was not identified and clarified, i.e., profiled as core job/ knowledge and skills area) | none | none | none |
| **2nd PSL 2: SUESM** | | | | |
| 1st PSL 3: SUE, of 2nd Sector | 1. Managing encroachment of wetlands, riparian reservations, and ecologically sensitive areas and sites (MEWRRESAS)<br>2. Monitoring and controlling encroachment on forest areas (MCEFA)<br>3. Implementing green urban economic development programs and projects (IGUEDPP) | 7th COL 2: MEWRRESAS<br>8th COL 2: MCEFA<br>9th COL 2: IGUEDP | 3 | 13.0 |
| 2nd PSL 3: SM, of 2nd Sector | 1. Densification of urban land-use (DULU)<br>2. Conducting social impact assessment (CSIA) | 10th COL 2: DULU<br>11th COL 2: CSIA | 2 | 8.7 |

| | | | | |
|---|---|---|---|---|
| **3rd PSL 3: UI** | | | | |
| 1st PSL 3: I, of 3rd Sector | 1. Designing water supply, sanitation facilities, and quality assurance (DWSSFQA)<br>2. Designing and supervising energy infrastructure and services, quality assurance, and standards of services (DSEISQASS) | 12th COL 2: DWSSFQA<br>13th COL 2: DSEISQSS | 2 | 8.7 |
| 2nd PSL 3: U of 3rd Sector | 1. Designing urban buildings and structures (DUBS)<br>2. Developing guidelines/ standards for quality as-surance for urban buildings and structures (DGS-QAUB)<br>3. Approval and supervision of urban infrastructure (ASUI)<br>4. Designing urban transportation infrastructure and terminal facilities (DUTITF) | 14th COL 2: DUBS<br>15th COL 2: DGSQAUB<br>16th COL 2: ASUI<br>17th COL 2: DUTITF | 4 | 17.4 |
| **4th PSL 3: USSI** | | | | |
| 1st PSL 3: US of 4th Sector | 1. Promoting economic growth and business support (PEGBS)<br>2. Promoting quality of life and security (PQLS) | 18th COL 2: PEGGBS<br>19th COL 2: PQLS | 2 | 8.7 |
| 2nd PSL 3: SI of 4th Sector | 1. Administering national and local city/municipal government policies (ANLCMGP)<br>2. Urban governance (Public relations and corporate affairs) (UG/PRCA)<br>3. Research, product development, and innovation and technology service (RPDITS)<br>4. Promoting social inclusion and cultural preservation (PSICP) | 20th COL 2: ANLCMGP<br>21st COL 2: UG/PRCA<br>22nd COL 2: PRDTS<br>23rd COL 2: PSICP | 4 | 17.4 |
| **Total** | -- | -- | **23** | **100.0** |

**Source:** Authors 2021

(PT) to planning artisans (PA), i.e., PS: PP: PT: PA, for example, are independent of the ratio and respective numbers in each category of competency for other professions, say, road engineering, urban demography, landscape architecture and land surveying.

Two academic criteria for specialist competencies were masters degree with preference for a doctorate in strategic jobs requiring conceptual, research, and advisory planning competencies. Criteria for functional competency were five, that is: at least experience of eight years in critical thinking and policymaking, strategic leadership, tactical knowledge and skills, certification through registration by statutory regulatory body for the relevant profession, and membership to relevant professional association. Strategic management, expert knowledge, and leadership skills, and program specialist and coordinator are the four identified planning occupational positions for specialists.

The two academic criteria for professional competency are: at least a bachelor degree or/and higher national diploma with a masters degree also sought. The four

required functional competencies are: concepts, elements, principles, techniques and theory; critical thinking; certification through registration; and membership to relevant professional association. The three main categories of job occupations for the professionals are in sub-managerial operations, including: implementation of policy, technical services and supervising performance of tasks.

Technician competency has one academic criterion; at least an ordinary diploma in specific aspects of program and project activity in the urbanization sector as a whole. However, criteria for functional competency require five operational skills covering: information and communication technology (ICT); geographic information system (GIS); remote sensing; computer-aided design (CAD); or/and computer-aided cartography (CAC). The range of technicians' operational occupation jobs cover use of equipment and instruments, instrumentation and implementation. Finally, criteria for academic competency of artisan is primary or/and secondary education. Criteria for functional competency are: one-year artisanal training, preferably through apprenticeship; on job training in the use of relevant urbanization sector machines, tools, and equipment; and elementary technical know-how in machines, tools and equipment repair, storage and record-keeping.

**Profiled Planning Occupation Positions**

One hundred and fifty required jobs were profiled from the 23 core competencies and mapped in **Table 6**. Forty-five technicians representing the highest proportion at 30.0% of the total were required; professionals at 27.3%, and the combined proportions of technicians and artisans at 54.7%. No competency was required for First Planning Sector Level 1: Budgeting i.e., 1st PSL 1: B. However, six jobs accounting for 4.0% were profiled for First Primary Activity Level 3: Budgeting i.e., 1st PSL 3: B of 3rd sector. This distribution of competencies by percentage show technicians, followed by professionals, represent the highest and the second-highest required competencies, respectively. The proportion of specialists was the lowest at 18.0%.

The 150 jobs were aggregated and mapped by planning sectors level 2 and competences to confirm the pattern of distribution of the jobs in level 3 where they are disaggregation (**Table 7**).

## DISCUSSION

**Suitability of the Framework in Ascertaining Planning Sectors and Competencies**

Starting with disaggregation of MPS L 1: US, to four level 2 and nine level 3 planning sectors, respectively; 23 core competencies in level 3 sectors

**TABLE 6:** One hundred and fifty level 3 planning sector jobs

| Level 3 Planning Sector | No. of Profiled Jobs by Categories of Competencies | | | | Total No. and Percentage Profiled Jobs | |
|---|---|---|---|---|---|---|
| | Specialist | Professional | Technician | Artisan | Total | % |
| **1st PSL 2: PCB** | | | | | | |
| 1st PSL 3: P of 1st Sector | 5 | 5 | 7 | 1 | **18** | **12.0** |
| 2nd PSL 3: C of 1st Sector | 3 | 2 | 8 | 8 | **21** | **14.0** |
| 3rd PSL 3: B of 1st Sector | 1 | 3 | 1 | 1 | **6** | **4.0** |
| **2nd PSL 2: SUEM** | | | | | | |
| 1st PSL 3: SUE of 2nd Sector | 3 | 6 | 2 | 6 | **17** | **11.2** |
| 2nd PSL 3: SM of 2nd Sector | 1 | 4 | 2 | 3 | **10** | **6.7** |
| **3rd PSL 2: IU** | | | | | | |
| 1st PSL 3: I of 3rd Sector | 5 | 7 | 6 | 1 | **19** | **12.7** |
| 2nd PSL 3: U of 3rd Sector | 2 | 5 | 4 | 5 | **16** | **10.7** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **4th PSL 2: USSI** | | | | | | | |
| 1st PSL 3: US of 4th Sector | | 3 | 5 | 9 | 7 | **24** | **16** |
| 2nd PSL 3: SI of 4th Sector | | 4 | 4 | 6 | 5 | **19** | **12.7** |
| **Total of Profiled Jobs by Category of Competency** | **Total** | **27** | **41** | **45** | **37** | **150** | **100.0** |
| | **%** | **18.0** | **27.3** | **30.0** | **24.7** | **100.0** | |

**Source:** Authors 2021

**TABLE 7:** One-hundred and fifty aggregated into level 2 planning sector jobs

| | **Categories of Competencies** | | **Level 2 Planning Sectors** | | | | **Total No. and Percentage of Profiled Jobs** | |
|---|---|---|---|---|---|---|---|---|
| | | | **PCB** | **SUESM** | **IU** | **USSI** | **No** | **%** |
| 1 | Specialists | | **9** | **4** | **7** | **7** | 27 | **18.0** |
| 2 | Professionals | | 10 | 10 | 12 | 9 | 41 | **27.3** |
| 3 | Technicians | | 16 | 4 | 10 | 15 | 45 | **30.0** |
| 4 | Artisans | | 10 | 9 | 6 | 12 | 37 | **24.7** |
| **Total Profiled Jobs/ Competencies by Planning Sectors** | | **No** | **45** | **27** | **35** | **43** | **150** | **100.0** |
| | | **%** | **30.0** | **18.0** | **23.3** | **28.7** | **100.0** | |

**Source:** Authors 2021

were profiled into 150 jobs. The VC model provided an appropriate framework for ascertaining the sectors and competencies. The profiled jobs were disaggregated within the four tracks of urbanization discussed earlier in the paper: namely, six secondary cities; sustainable urban environment resting on low carbon urban system that is supported by national roadmap for green secondary city development and green growth, climate resilience and low carbon development strategy; national spatial development framework; urban and rural spatial land uses informed by the national master plan and characterized by smart agglomeration of cities as well as densified and clustered rural settlements.

The high proportion of 12.7% of 2nd PSL 3: SI of 4th sector, i.e., special initiatives (SI) planning sector cover administering national and municipal policies; urban governance through public relations and corporate affairs; research, product development, and innovation and technology (IT) services; and promoting social inclusion and cultural preservation. Specialists and professionals accounted for 5.3% of the jobs, including senior urban governance specialists, urban research, product development, innovation specialists, senior gender equality, and women empowerment specialists. Profiled positions for professionals included senior research and development (R&D) manager, public archives officer, biotechnology development scientist, and agro-product development research and development scientist.

1st PSL 3: P of 1st sector and 2nd PSL 3: C of 1st sector, accounted for 13.6% of the 23 core planning jobs, respectively, while 1st PSL 3: B of 3rd sector had none. The three planning sectors account for 30% of all profiled required jobs. Specialist and professional jobs accounted for 27.8% of the jobs in the sector. Specialist jobs include senior urban human settlement planning and development specialists who would also be director of planning, urban development engineer, landscape architecture specialist, urban design specialist, and urban economy specialist. Required

professionals include urban planners, regional/rural planners, land surveyors, landscape architects, and urban development economists. Seven required technicians include urban planning assistant, regional/rural planning assistant, urban land-use planning assistant, land survey assistant, landscape reconstruction assistant, informal settlements upgrading assistant and land-use change assistant.

1st PSL 3: US of 4th sector, accounts for 9.1% of the planning sector. The distribution of profiled jobs is 12.5% for specialist jobs of senior urban green economic growth specialist, senior urban social development specialist, and urban business and investment specialist; 20.8% of professionals included trade and business licensing officer, registrar of companies, housing experts, community markets officer and urban economist. Profiled technicians accounted for the highest proportion at 37.5%, covering the jobs of social work assistant, electrical and electronics technologist, data analysis assistant, superintendent of community market, assistant registrar of births and deaths, assistant demographer, public galleries and achieve assistant, weather station technologist and employment/labor assistant, office administrative assistant, and tax and revenue assistant.

The aggregation and mapping of the 150 profiled level 3 job positions in level 2 sector jobs reflect the distribution. 1st PSL 2: PCB with 45 profiled job positions accounting for 30% is confirmed as the most dominant sector in urbanization. Distribution of required job by categories of competencies show professionals and artisan account for 27.3% and 24.7%, respectively. Technicians had the highest proportion at 30%. While 2nd PSL 2: SUEM account for smaller proportion of the 150 profiled jobs at 18% with professionals accounting for highest proportion at 37%. This is due in part to the need for professional cadre including green and smart city planning expert, green growth and climate change officer (GGCCO), urban demographer, urban social impact assessment officer, wetlands and riparian reserve conservationist, and parks and recreational manager reflecting the importance of strategic urban environment and social management (SUESM). In 3rd PSL 2: IU with 23.3% of all profiled jobs, professionals also account for the highest proportion at 52.2% in the sector. 4th PSL 2: USSI accounted for the second highest proportion at 28.7% of the jobs, with technicians accounting for the highest proportion at 34.9%, followed by artisans at 32.4%.

**Expression for Simultaneous Disaggregation**

Expression for simultaneous disaggregation to ascertain planning sectors and competencies was derived as follows: the form the expression of disaggregating took begins with expression for level 1 being 1st PSL 1; followed by 2nd PSL 1; then third - 3rd PSL 1; and fourth - 4th PSL 1 sectors, respectively. Accordingly, the general expression for planning sectors in the framework is $x$ (PSL $n$), where: $x$ is the numerical "position of the sector" in the value chain serial order and $n$ is the numerical "position of the level" of vertical disaggregation in the series. Disaggregation to level 3 introduced the need to account for this particular level by inserting the numerical value to define its vertical occurrence at the value of 3. This makes it and all subsequent levels after it to be defined by the position of respective vertical occurrence during profiling a specific job, to the lowest possible level in a sector.

Accordingly, disaggregation of 1st PSL 2: PCB to level 3 resulted to 1st PSL 3: Planning of 1st sector; 2nd PSL 3: Coordination of 1st sector; and 3rd PSL 3: Budgeting of 1st sector which also apply in other three core planning sectors i.e., level 2 sectors, to level 3 illustrate this. In disaggregation to the lowest level $n^{th}$ in a planning sector, beginning with level 1, level 2, level 3; up to level $n^{th}$; $n^{th}$ represent the lowest possible level in the urbanization value chain. It is the point of performing task at work place that makes it subjected to established academic and functional occupation competency criteria. The periodic occurrence was ascertained and inserted in the expression $x^{th}$ PSL $n^{th}$ so that the expression for disaggregating planning sectors is: $x^{th}$ PSL n: $y^{th}$ of sector $x^{th}$, and is summarized as $x^{th}$ PSL $n^{th}$: $y^{th}$ of $x^{1...j}$.

Ascertaining competencies through disaggregation happened in three stages. First, the four categories of competencies were mapped in the framework of VC model. Second, 23 competencies level 2 were ascertained through profiling them against the four planning sectors with transition from level 2 to level 3 represented by expression level $n^{th}$. Third, the 150 jobs

in level 3 competencies were disaggregated to also ascertain them through profiling against established academic and functional competency criteria. Full expression for disaggregation of the competencies in the value chain was presented as $x^{th}$ COL $n^{th}$. Constant $x$ for each sector was substituted in the value chain along level $n$ with $x$ in specialist competency being 1st followed by professional, technician and artisan as 2nd, 3rd, and 4th, respectively. The full expression for disaggregation in profiling the 23 level 2 competencies into 150 jobs in level 3 is similarly summarized as $x^{th}$ COL $n^{th}$: $z^{th}$, of competency $x^{th}$, i.e., $x^{th}$ SAL $n^{th}$: $z^{th}$ of $x^{1...j}$, each parameter representing the same function of disaggregation in planning sectors.

The two expressions for disaggregation to ascertain planning sectors and competencies, respectively, were combined into one overall expression representing structural and functional framework of the VC model. In the expression, planning sectors i.e., $x^{th}$ PSL $n^{th}$: $y^{th}$ of $x^{1...j}$; $x^{th}$ is the value of the sector in the series, $n$ is level of disaggregation and $y^{th}$ is the iterance position, i.e., periodicity of any third competency reflecting task area requiring specific competency along any of the three levels. Similarly, $x^{th}$ and $n$ notations in expression $x^{th}$ COL $n^{th}$: $z^{th}$ of $x^{1...j}$ represent same values with $z^{th}$ being the iterance position, i.e., periodicity of any third competency that would be profiled for specific job occupation.

The combined overall expression for simultaneous disaggregation of the planning sectors and competencies is:

$$x^{th}\ PSL\ n^{th}: y^{th}\ of\ x^{1....j} <=> x^{th}\ COL\ n^{th}: z^{th}\ of\ x^{1...j}$$

*Where:*

- *PSL $n^{th}$: is planning sector level $n^{th}$*
- *COL $n^{th}$: is competency level $n^{th}$*
- *PS: is planning sector*
- *CO: is competency*
- *$x^{th}$: is planning sector/competency $x$ at position $x^{th}$ along any one levelin the value chain*
- *L: is level*
- *$n^{th}$: is level $n$ of disaggregation of anyone planning sector or competency in the series vertically towards intersection of planning sector and competency that determine profiled competency into job for recruitment into the planning establishment*
- *$j^{th}$: is the point of disaggregation of any sector or competency "x" at level "n" in the series*
- *$y$ is $y^{th}$ position of disaggregated sector from the $x^{th}$ sector along the value chain in and after level 3*
- *$z$ is $z^{th}$ position of disaggregated competency profiled into planning job in the value chain*
- *$x^{1...j}$ are all subsequent disaggregated sectors/ competencies from 1 to j, with j being the last outcome of disaggregation*
- *1 is the first core planning sector or competency*
- *$j$ is the outcome of the last disaggregation representing point of task performance and work operations that also define required competency, that is profile into a planning job in urbanization value chain*
- *<=> defines interactive relations between planning sectors and profiled competencies as the two sets disaggregate simultaneously from MPS: US in the urbanization sector value chain.*

## CONCLUSION

The paper makes four conclusions. First, the structure and function of VC model and the expression for simultaneous disaggregation, $x^{th}$ PSL $n^{th}$: $y^{th}$ of $x^{1....j}$ <=> $x^{th}$ COL $n^{th}$: $z^{th}$ of $x^{1...j}$; provide a framework of methodology for systematic ascertaining of planning sectors and competencies. The model and expression allow variation of number of planning sectors any one value chain represents. This property affords the framework the flexibility and versatility needed to perform methodological function of ascertaining planning sectors and competencies in public planning. Second, horizontal disaggregation along anyone sector and category of competency in the value chain, and vertically to level $n^{th}$ where the two intersect, provides a methodological compliment in preparing plans in two ways. While issues in each planning sector are ascertained; ascertaining required planning competencies follow through profiling against planning tasks that are identified in the ascertained sectors. The expression for simultaneous disaggregation therefore, caters for applying

the framework in public planning beyond mere ascertaining planning sectors and competencies. Third, simultaneous disaggregation though, happens independently for planning sectors and competencies; while the two inter-relate in the process represented by $x^{1...j}$ sectors and competencies; the process ends at *j*. Lastly, simultaneous but independent disaggregation of the sectors and competencies minimizes the risk of mismatching planning tasks with task performers in hiring new planners or assigning those on employment planning duties.

## RECOMMENDATIONS

The paper recommends adopting the structure and functions of the VC model, and the expression for simultaneous disaggregation as a framework for ascertaining planning sectors and competencies, starting with the conduct of planning studios in the training of planners. Planning consulting firms, municipal and regional planning bodies will be sensitized on competency for applying the framework in preparing plans. Tailor-made modular training curriculum for capacity professional development (CPD) will be formulated for the sensitization. The attendee of CPD sessions will build into a critical number of training of trainers (TOTs). The TOTs will incentivize public planning authorities and agencies will incentive to participate in the implementation of selected planning studio prototype plans for towns, urban and rural neighbourhoods, and regions where the planning studio fieldwork is carried out to further develop the application of the framework.

Lessons learnt from this initial application could be used to improve and adjust the framework as it is progressively applied in combination with other existing methodologies of preparing plans. Each case plan for towns, rural or urban neighbourhood, and regions will be prepared as a series of activities undertaken by specialist and professional planners, technician and artisan planning cadres. Stakeholders (SH) and interest holders (IH) will form the fifth and sixth categories of competency involved to account for plural democratic participation in developing the application of the framework in preparing the plans.

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