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THE PROMOTION TREND AMONG CSIR RESEARCH SCIENTISTS' FROM (2017-2021) AND IMPLICATIONS FOR MANAGERIAL DECISION-MAKING

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Abstract: Promotion plays a key role in employee satisfaction. It involves pay increase, change in responsibilities and job titles. The Council for Scientific and Industrial Research (CSIR) is at the forefront of scientific research and technological innovation in Ghana. It has thirteen (13) institutes with different research mandates across the Ghana. The study determines the promotional trends among senior members in the CSIR over a five-year period. Results show a decreasing trend in the number of applications received for processing. Most applications received were of the senior research scientist grade. Though greater numbers apply to the senior research scientist grade only a few of the applicants apply to the chief research scientist grade. There were more male applications than female applications. Regulations were found to be a major influence of the promotion process in the CSIR.

Keywords: Council for Scientific and Industrial Research (CSIR), scientific research, technological innovation, promotional trends.

1. INTRODUCTION

The performance of an organization, to a large extent depends on the performance of its human resource. Promotion is important to meet both institutional and individual goals. Employee productivity is often determined by their achievements which is translated into rewards, promotion and motivation. Promotion and motivation are essential in maximizing an employee output in an organization (Emurugat, *et. al.*, 2017; Manzoor, *et al.*, 2021). Studies available indicates a correlation between job performance and employee motivation. Kuvaas *et al.*, (2007) in a study conducted in Norway assessed the role of employees, intrinsic and extrinsic motivation, and their performance in the finance trade sector and as store managers. Their study concluded that intrinsic and extrinsic rewards are considered a principal motivator the employees. A study conducted by Maicibi and Nkata (2005) noted that promotions bring about elevated status in an organization, increased salary and a feeling of self-worth.

Promotion as defined by Mathias *et al.*, (2013) is when an employee is transferred from one grade to another with a higher reward, responsibility and level in the organization. According to Neck *et al.*, (2018) job promotion is an increase in labor force or employees in better jobs, achievements, increased wages or salaries compared to preceding work or responsibilities. Promotion defined by Roszyk-Kowalska and MaciejDuda (2017) is the movement of a person to a higher position in the hierarchy of an organization.

Robin and Judge (2013) observed that job promotion brings about opportunities for personal growth, more responsibility and increased social standing. A study conducted by Gabriel *et al.*, (2016) examined the relationship between effective management of rewards on the performance of employees in the public service sector of Anambra state, Nigeria. They

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found out that motivation of employees is an important factor because it enhances performance of both the firm and employee. In conclusion, intrinsic rewards like employee development, recognition, and pay/salary have significant and positive effect on the performance of employees in the public service of Anambra. Promotion is one of the key factors for the achievement of any organizational goals since it leads to job satisfaction which translates to high performance and the maintenance of quality and standard (Abdulmumini, 2021).

Organizations and professions have clearly defined rules that offers their employees the opportunity to pursue or embark on a career development leading to their promotions know as vertical mobility dimension (Ladinsky, 1963; Maclean, 1992). Promotion is one of the many reinforces of reward system to help motivating employees (Wong, 2009). Robbins and Coulter (2002) listed pay recognition, desirable work assignments, autonomy and participation as other forms of rewards. Employees are likely to reduce their efforts if rewards are based only on non-performance factors such as seniority, job title or across the board pay rises. The Peter Principle states that using promtion solely as a reward for good perfromance tends to make people rise to their level of competence and maximum productivity.

SUCESSION

Succession is important in an organization as workers continue to exit the workforce due to illness or death, retirement or new job opportinities. There is the need to recuirt or train suitable candidate to hold a reputable management position (McCarroll, 2020). A succession plan is important to ensure that the best staff are kept within the institution. For the continous exsitence of an institution, it is essential to establish a succession management plan that will ensure the replacement of knowledge or expertise that the company (Oppong, and Oduro-Asabere, 2018). According to Cole and Gerald (2005) employees likely to get to the top for leadership roles needs to to train, develop and promote them by the organization. As an employee gets promoted to higher ranks the closer to the senior managerial position.

WOMEN IN STEM

Women are underrepresented in STEM worldwide. Women who pursure higher education and advance in their research careers are faced with gender disparitry (Ley and Hamilton, 2008). A study conducted in the USA by Pohlhaus *et al.*, (2011) showed that the percentage of females (57%) awarded early career grants was more compared to males (42%) for the US National Institute of Health (NIH) extra mural programs. However with independent investigator initiated research grants, female awardees was significantly lower (27%) to 72% for males. The difference was attributed to work life issues where women are required to show exceptional productivity during their childbearing years in order to secure the next position. Other studies have identified the following factors that affects females in STEM; Work and family life balance, discrimination, lack of professional resources, harassment, time management, lack of motivation (Quinn and Smith, 2018; Fathima , *et al.*, 2020)

The CSIR Research Scientist career progession or Senior Members promotion is based on their qualifications, period of services and outputs. These outputs are publications, Commercialization activities/Technology Transfer/Extension Activates and Administrative Experiences. Applications submitted by research scientists for considerations for promotion to various grades (Senior, Principal and Chief Research Scientist) are guided by rules, regulations and procedures established by the Council which are revised from time to time with the latest been 1st January, 2021.

The CSIR is the main research institute in Ghana. It was first established in the year 1958 by Research Act 21 to bridge the gap between science and industry. It was re-established on 26th November, 1996 by CSIR Act 521. The CSIR is to advise government on Science and Technology and to coordinate research and development activities and to work in partnership with other science institutions for the achievement of national goals. The CSIR consist of 13 research institutes spread across the country with the country, Ghana with the head office serving as the defector institute. The thirteen (13) institutes are grouped into the agriculture based institutes and the industrial based institute. The table below gives the Mandate of each institute.

Table 1: The thirteen (13) Institutes of CSIR- Ghana and their mandates

INSTITUTE	MANDATE
AGRICULTURE BASED INSTITUTES	
Animal Research Institute (ARI)	Animal husbandry and products
Crops Research Institute (CRI)	Food crops production and improve crop varieties

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Forestry Research Institute of Ghana (FORIG)	Forest resources management				
Oil Palm Research Institute (OPRI)	Oil palm and coconut production and management				
Plant Genetic Resources Research Institute (PGRRI)	Collection, conservation, documentation, utilization and distribution of genetic resources of Ghana.				
Savanna Agricultural Research Institute (SARI)	Food crops in the Northern zone of Ghana				
Soil Research Institute (SRI)	Soil resources and fertility				
INDUSTRY AND NATURAL SCIENCES					
Building and Road Research Institute (BRRI)	Building materials development, road and building sector				
Food Research Institute (FRI)	Value addition to food crops and post-harvest losses				
Institute of Industrial Research (IIR)	Instrumentation				
Institute for Scientific and Technological Information (INSTI)	Dissemination of scientific and technological information and application of technology in agricultural activities				
Science and Technology Policy Research Institute (STEPRI)	Formulation, monitoring and evaluation of Science and Technology Policies				
Water Research Institute (WRI)	Water resources management and aquaculture development				

Promotion in CSIR is aimmed at determing the contributions of the applicnat to CSIR mission and goals as well institutes, mission and vission. It is mandatory that all Scientists should apply for promotion. Research Scientist (RS) and Senior Research Scientist (SRS) are on five (5)-year contract, and whose renewal depends on promotion. Principal Research Scientist (PRS) and Chief Research Scientist (CRS) are on tenure, and may apply for post-retirement contract. PRS and CRS are on four (4) and three (3) years tenure respectively and also applies when their tenures are due. Ultimately, promotion improves the visibility of the Scientist. The objective of the study is to examine the promomotion trend among Research Scientists of CSIR and to ascertain the succession plan of the various institutes.

RESEARCH QUESTIONS

- Is promotion linked to motivation in the CSIR and what accounts for employee performance?
- Does promotion have an impact on staff perfomance ?
- Does the various institutes have a sucession plan?
- What is the gender dimension in the CSIR?

2. MATERIALS AND METHODS (SEE DR. MAHAMA'S PAPER).

Promotion process at the CSIR operates at three levels :

Level 1: At the Institute level

Level 2: At the CSIR Head Office - Office of the Deputy Director-General

Level 3: At the CSIR Head Office - Office of the Director-General

The Applicant starts the application process at the institute. The Director consitutes a screening committee to screen the applications and award marks for the various entries. After the institute screening, the committee makes a recommendations and sends back to the applicant for necessary correction if there is a need.

At Level 2, the application is submitted at the Sectoral which is handled at the office of the Deputy Director-Geneeral. Two internal assessors of sitting or retired directors are selected to carry out an assessment of the application and marks awarded based on supporting documents (Publications, Commercialization and Administrastive) when the applicant scores the minimum passmark, the application is returned to the applicant for corrections. Corrected applications are returned to the Office of the Deputy Director-General with selected journal papers/publications.

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The application is then sent to two external reviewers selected by Director-General from a list of four reviewers in the area of specialization of the applicant. When the two reports are received from the external reviewers and are positive a complete dossier on the applicant and forwarded to Director-General. In case one report is negative, a third assessor shall be sought. In case a third assessor is sought and his/her report is also negative, it means there are two negative reports on the applicant. This implies that the application has failed and will therefore not go to APB at all.

At Level 3, the Director-General organize a Final Appointment and Promotions Board through a schedule officer to consider the dossiers on completed applicants. The composition of the Appointment and Promotion Board consists of the Chairperson (the Director-General), Deputy Director-General, Director of Administration, Applicant's Director, 2 Permanent Assessors, one for Biological Sciences, and one for Physical Sciences and 2 Specialists (in the area of the applicant). Also, in attendance is the schedule office with his/her assistant.

The APB reviews the dossiers of the applicants and makes a determination on the suitability (or otherwise) for promotion. As the final authority within the scheme of CSIR promotions, the APB has over the years helped shape the promotion exercise to a very large extent. Some of their decisions eventually become rules and reference points governing the promotion exercise.

The paper therefore assessess Senior Members promotion received at the CSIR Head Office from the various institues to various research grades (Senior, Principal and Chief research scientists grade). Data was analysed using MS Excel.

3. RESULTS

A total of 202 applications were received from the various institutes. CSIR-CRI had the highest applications of 48 representing 24%. The least number of applications received was 4 representing 2% by Head office/CCST. The second highest applications of 24 was submitted by CSIR- SARI representing 12%. The submissions by the other institutes are CSIR- FRI (7%), CSIR-WRI (9%), CSIR-FORIG (7%), CSIR-SRI (6%), CSIR-ARI (8%), CSIR-BRRI (6%), CSIR-STEPRI (4%), CSIR-INSTI (3%), CSIR-IIR (4%), CSIR-PGRRI (3%), and CSIR-OPRI (3%). The result is represented in Table 1.

The year 2017 recorded the highest number of applications of 56 with the least number of 22 recorded in the year 2019. A total application of 53, 42 and 29 were recorded in the years 2018, 2020 and 2021 respectively. The results show a decreasing trend of promotion in the CSIR and it is presented in Figure 1.



Figure 1: Promotion trends among CSIR Institutes

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	2017	2018	2019	2020	2021	Total
Institutes						
ARI	3	7	2	4	1	17
CRI	11	9	6	16	6	48
FORIG	1	7	0	2	4	14
OPRI	3	1		1	1	6
PGRRI	3	2	0	1	1	7
SARI	8	1	7	2	6	24
SRI	3	3	2	3	1	12
BRRI	4	5	0	3	1	13
FRI	6	5	2	1		14
IIR	0	5	1	3		9
INSTI	3	3	0	0	1	7
STEPRI	4	2	0	1	2	9
WRI	7	2	2	5	2	18
Head						
Office/CCST	0	1	0	0	3	4
	56	53	22	42	29	202

 Table 1: Yearly Applications received from the various institutes from the years 2017-2021

Female applicants constituted 25% of all applications received representing a total number of 50 whilst a total of 152 applicants were males representing 75%. The highest female application number of 15 was received in the year 2017. CSIR- CRI presented the highest number of female applications of 16. The following institutes CSIR-IIR, CSIR-SRI, CSIR-SARI and CSIR-OPRI had the least number of 0. They were no female applications submitted from these institutes. 62% of female applications applied for the Senior Research Scientist grade, 20% to the Principal Research scientist grade, 4% to the Chief Research scientist grade, 12% to the Principal Technologist grade and 2% to the Chief Technologist grade. Table 2 shows female applications received for the period under review.

Year of applications								
	2017	2018	2019	2020	2021			
No. of Applications /Position Applied for	15	13	3	13	6			
Senior Research scientist grade	6	10	2	10	3			
Principal Research scientist grade	2	3	1	3	1			
Chief Research Scientist grade	1	0	0	0	1			
Principal Technologist grade	6	0	0	0	0			
Chief Technologist grade	0	0	0	0	1			

Table 2: Number of Female Applications received

EDUCATION

Out of the applications received, a total of 111 were PhD holders, 89 MPhil holders and 2 consisting of 1 HND holder and 1 BSc holder. PhD constituted 55%, MPhil 44% and others 1% of all applications received. With PhD been the minimum requirements for Senior Members (Core) in the CSIR, the high number of applications from PhD holders meets the new regulations. Out of the total number of 50 female applications, 24 applicants were PhD holders which constitute 48% of all female applications received and 52% were with Master's degree. The number of female applications received from the various institutes are represented in Table 3

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	Years					
Institutes	2017	2018	2019	2020	2021	Total
CRI	6	1	0	6	2	15
ARI	1	3	0	1	0	5
FORIG	1	2	0	0	0	3
SRI	0	0	0	0	0	0
SARI	0	0	0	0	0	0
OPRI	0	0	0	0	0	0
PGRRI	1	0	0	0	1	2
FRI	1	3	2	1	0	7
INSTI	1	1	0	0	1	3
STEPRI	3	2	0	1	1	7
BRRI	0	0	0	1	0	1
WRI	1	1	1	3	0	6
IIR	0	0	0	0	0	0
HEADOFFICE	0	0	0	0	1	1
Total	15	13	3	13	6	50

 Table 3: Female applications submitted by the various institutes from year 2017-2021

GRADES

65% of the applications were for the Senior Research Scientist and analogous grade, 20% for the Principal Research Scientist and analogous grade and 6% for the Chief Research Scientist and analogous grade. For the Scientific Secretary grade, a total of 3 applications each were received for the Senior and Principal Scientific secretary grades which constitute 1% each of the total applications. A total of 11 applications received were for the technologists' grade. 5 applied for the senior technologist grade, 5 for the principal technologist and grade and 1 for the chief technologist grade. This constituted 4% of the total applications received.

CSIR-CRI had the highest applications of 31 to the Senior Research Scientist grade and the least number of 2 was submitted from CSIR –Head Office. The submissions for the various grades are presented in Table 4.

	SRS	PRS	CRS	SSS	PSS	ST	PT	СТ
CSIR-ARI	14	2	1					
CSIR-CRI	31	6	3			2	5	1
CSIR-FORIG	7	5	2					
CSIR-SARI	17	4	1		2			
CSIR-SRI	10	1		1				
CSIR-OPRI	5	1						
CSIR-PGRRI	5	2						
CSRIR-FRI	10	2	1			1		
CSIR-BRRI	6	5		2				
CSIR-IIR	5	3			1			
CSIR-STEPRI	4	3	2					
CSIR-INSTI	6	1						
CSIR-WRI	10	5	1			2		
CSIR-H/O	2	1	1					
	132	41	12	3	3	5	5	1

Table 4: Applications received for the various grades from the year 2017-2021

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4. DISCUSSIONS

The number of applications received is an indication of the progress level of researchers/core members and their research activities within the CSIR. This implies that Research Scientist views promotion as a tool for developing their requisite skills, visibility tool for showcasing their research work, provide opportunities for growth and a source of motivation since it is accompanied with an increase in salary. This has described by (Miller, 2017) builds a competitive nature in the employee to strive for more and showcase competence towards the tasks.

The trend for promotions as observed within the CSIR was on the decline from the year 2017 to 2021. The least number of applications received in the year 2019 can be attributed to the introduction of the new regulations introduced on promotion. The new regulations stated the number of journal papers needed for promotion was increased from 3-4-4 to 5-7-7. This implies to move from the Research Scientist grade to the Senior Research Scientist grade requires five (5) Refereed journal papers whilst for subsequent promotion to the Principal and Chief Research scientist grades required seven (7) journal papers with the minimum qualification being a Master degree by Research from a recognized institution.

A possible reason for the high number of promotion applications received in the years 2017 and 2018 can be attributed to the number of publications required in those years. The number of journal publications required for the promotion to the various grades were 4-3-3. This implies to move from the Research Scientist grade to the Senior Research Scientist grade requires three (3) Refereed journal papers whilst for subsequent promotion to the Principal and Chief Research scientist grades required four (4) journal papers with the minimum qualification being a Master degree by Research from a recognized institution.

The high number of Senior Research scientist (SRS) grade applications received in the year 2020 was due to the introduction of the new policy on PhD in the ensuing year. The New Regulation states that the entry point for Research Scientist into the CSIR will be PhD and the qualification needed for the promotion from the Research Scientist grade to the Senior Research Scientist grade will be a PhD. This is because PhD holders are believed to be expertise in their field of study, have acquired additional skills and knowledge in the area of specialty, have insights and are able to contribute to the institution's vision and visibilities (Fikri, 2001). Research Scientist within the CSIR were required to submit their applications for promotion before proceeding to pursue their terminal studies hence the increase in numbers of applications for Senior Research Scientists grade. In the CSIR, regulations play a major role when it comes to staff promotions this is to give equal and fair grounds to every application.

SUCCESSION PLAN

For an organization to achieve its aim or vision there is a need for a succession plan to be part of its integral operations for the appointment of qualified staff in high-level positions and increasing confidence among staff (Gitiche, 2016; Stokes, 2018). With 40% applications received to the Principal Research Scientist and 6% to the Chief Research scientist grade, there is a good pathway for such to occupy managerial positions. However, for some institutions succession will be difficult since there are no applications for such positions. In the CSIR, there is a well-laid succession plan, this is evidence with the rotation of Deputy- Directors at the various institutes. The Deputy- Director position is a 2-year contract for senior members who are Principal Research Scientist.

GENDER DIMENSION.

Promotions within the CSIR are approximately equal and are on fair grounds. More women were found to be in the Agricultural sector compare to the industry sector. The results differ from a study conducted in Sweden where it was observed that women within the social sciences and humanities get promoted easily compared to their counterparts in the natural and agricultural sciences (Hjerm & Danell, 2013).

Some reasons associated with low female in STEM are family, social and cultural. A study conducted by Probert (2005) in the USA showed that family can be a negative factor for women's academic whilst Long (2001) observed that family life is negligible when it comes to career progression of woman. The gender disparity in STEM is a multifactorial issue that includes familial, social, cultural and institutional factors that cannot be ignored or overlooked. A study conducted by Probert (2005) in the USA showed that family can be a negative factor for women's academic whilst Long (2001) observed that family conducted by Probert (2005) in the USA showed that family can be a negative factor for women's academic whilst Long (2001) observed that family life is negligible when it comes to career progression of woman.

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5. CONCLUSION AND RECOMMENDATIONS

In the CSIR, regulation was found to play a significant in staff promotion this is to eliminate any form of favoritism and bias. Promotion was found to be linked to staff performance in the CSIR since for every new grade applied for comes with new requirement. The succession plan should be modified in order to enable Senior Research scientist within institutes that do not have Principal and Chief Research Scientist take key positions. There should be a review of the gender policy to allocate a percentage of recruitment of female scientist, this will enable all institutes to have a female representation. Though within the CSIR, promotion is on level playing grounds, more females need to be mentored and encouraged to attend conference to make their work visible and to break barriers associated with women in STEM. Promotion to the Principal and Chief Research Scientist grades were limited compared to the number of senior members that apply to the Senior Research scientist grade. From transition to Principal Research Scientist and Chief Research Scientist to have role models and mentored to get to the peak of the career.

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