CSIR-NIScPR Policy Bulletin/January-2022/03

CSIR-National Institute of Science Communication and Policy Research (CSIR-NIScPR)

Assessment of the Impact Created by CSIR-TWAS Fellowships

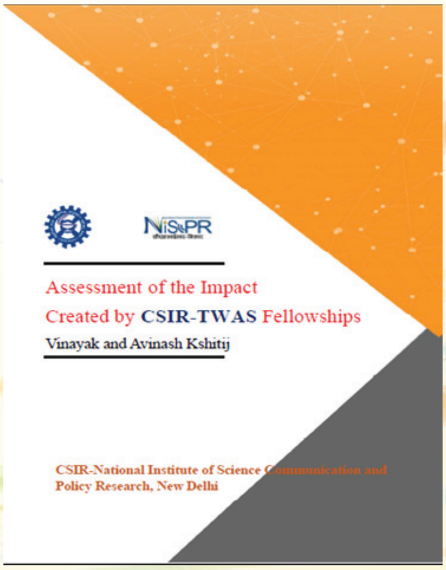
The CSIR-The World Academy of Science (TWAS) fellowships are being provided with an objective towards building scientific strength in the developing countries by providing an opportunity to S&T research scholars to pursue their postgraduate or postdoctoral programmes in CSIR laboratories. The International Science & Technology Affairs Directorate (ISTAD), a unit of CSIR, plays a key role in identifying and nurturing CSIR's global partnerships in the leading areas of research and development, and to foster collaborative and contract research in the frontier area of Science and technology (S&T). Both types of fellowship programmes under CSIR-TWAS scheme have been studied to assess the impact these programme have created.

Strong evidences have been observed in the postgraduate respondent datasets where the impact of the programme has been assessed highly conducive in reaching to present position, publishing research papers, attaining international visibility, in science communication skills, and in career prospects. Similarly, impact of the postdoctoral fellowship programme has been largely conducive in reaching to present position, developing co-operation network, publishing research papers, international visibility, developing science communication skills, establishing new research collaborations, career prospects, and consultancy. A tendency towards postdoctoral persuasion is found in many postgraduate respondents and in some postdoctoral respondents after the completion of the programme. Significant number of postdoctoral aspirants, from the postgraduate respondents, have been selected in the postdoctoral programmes in India and European countries, and some in USA. Many of the postgraduate respondents are either working in the same area of research or in multidisciplinary area of research.

74% of the CSIR-TWAS postdoctoral fellows who had spent substantial amount of time in CSIR labs had opined that they would definitely recommend implementation of CSIR technologies in their country while 11% of them felt that they would most likely recommend for meeting the technological need in their country (fig18).

Major Highlights

- 90% respondents find their expectation todevelop subject expertise met to very significant or excellent level.
- 86% respondents find their expectation of building collaboration networking met to very significant or excellentlevel.
- 90%respondents have met to very significant level excellent in career prospects.
- 61% of PhD fellow respondent are aware of CSIR technologies and all of them have observed usefulness of CSIR technologies in their native countries.
- 85% of postgraduate respondents, who are aware of CSIR technologies, will definitely recommend for the implementation of the CSIR technology in their countries.



CSIR-NIScPR Approach for Assessment of Impact Created by CSIR-TWAS Fellowships

This study is based on analysis of the primary data collected from the CSIR-TWAS fellowship awardee from 17 countries, viz. Bangladesh, Cameroon, Côte d'Ivoire, Egypt, Ethiopia, Ghana, Iran, Kenya, Mongolia, Nepal, Nigeria, Pakistan, Rwanda, Senegal, Tanzania, Togo, and Tunisia, from year 2002 to 2018. The questionnaire was designed to capture the impact of CSIR-TWAS fellowship on the personal development, career development, development of research capacity, collaborative strength development, etc

A survey was conducted among CSIR-TWAS postgraduate fellowship awardees from 17 developing countries from year 2002 to 2018 for this purpose. Majority of awardees participated in this survey are from Nigeria and Cameroon. Separately, another survey was conducted among CSIR-TWAS postdoctoral fellowship awardees from 20 countries in which majority of awardees participated from Nigeria and Egypt (Fig-1). Chemical sciences has been most lucrative for both the fellowships programmes.

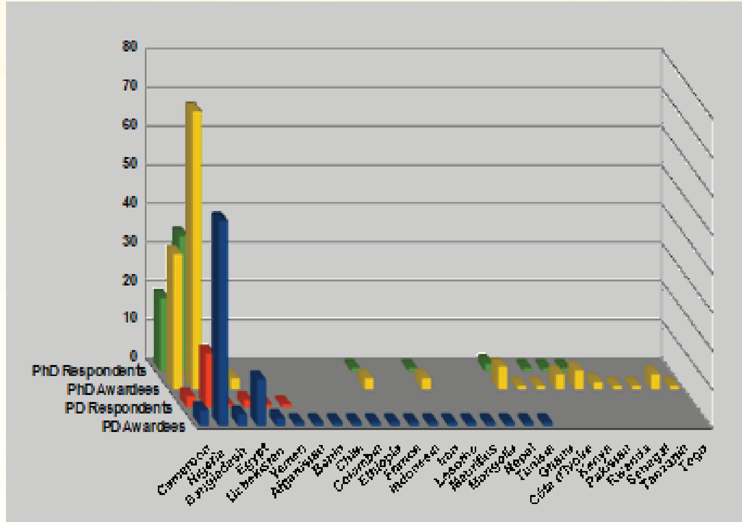


Figure 1: Country-wise distribution of awardees and respondents for the CSIR-TWAS Postgraduate (PhD) and Postdoctoral (PD) programmes.

33 CSIR laboratories as shown in Fig.- 2, the maximum number of number of respondents was hosted by CSIR-CFTRI, followed by CSIR-IICT and CSIR-NIIST. For the postdoctoral programme, major representation comes from CSIR-CBRI and CSIR-CECRI in the respondent dataset.

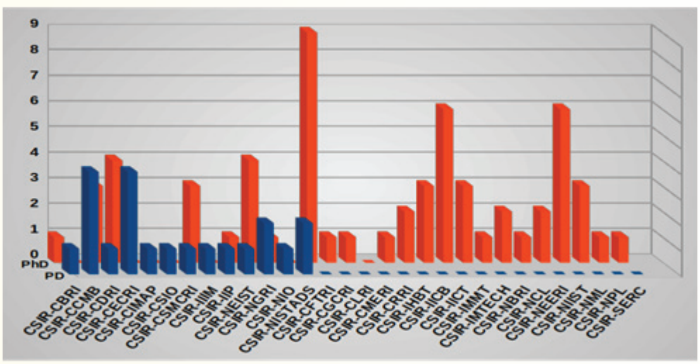


Figure 2: Number of respondents for the postdoctoral (blue) and for the postgraduate (orange) for the corresponding host institute of CSIR.

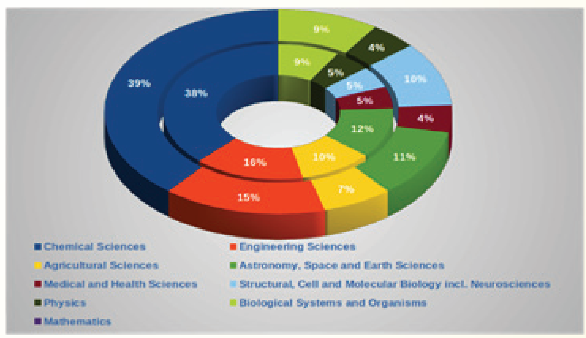


Figure 3 : A doughnut plot illustrating distribution of the CSIR-TWAS postgraduate fellowships among subject area. Inner ring represent result for awardee dataset and the out ring represents result for the respondent dataset.

Subject dominance

CSIR-TWAS postgraduate fellowship is being offered under 9 subject areas. Out of all 34 host laboratories of CSIR, the fellowship has been provided in 8 subject areas but for Mathematics. Dominance of Chemical Sciences is observed in the awardee dataset followed by Engineering Sciences.

On the other hand, in the postdoctoral respondent dataset we see increased participations in Astronomy, Space and Earth Sciences, Chemical Sciences, and Engineering Sciences as compared to the awardee dataset

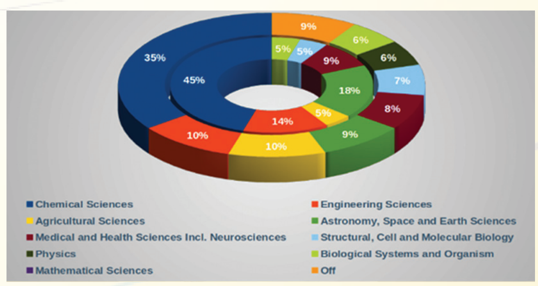


Figure 4 : A doughnut plot illustrating distribution of the CSIR-TWAS PD fellowships among subject area.Inner ring represent result for awardee dataset and the out ring represents result for the respondentdataset.

Value Addition Impact

Almost 90% respondents find their expectation to develop subject expertise met to very significant or excellent level. Nearly 86% respondents find their expectation of building collaboration networking met to very significant or excellent level. Expectations regarding the reputation of the host institute have been found to meet the excellent level with affirming majority. Around 86% of respondents find their expectation met to very significant or excellent level in earning research credentials while expectations of 90% respondents have met to very significant level excellent in career prospects.

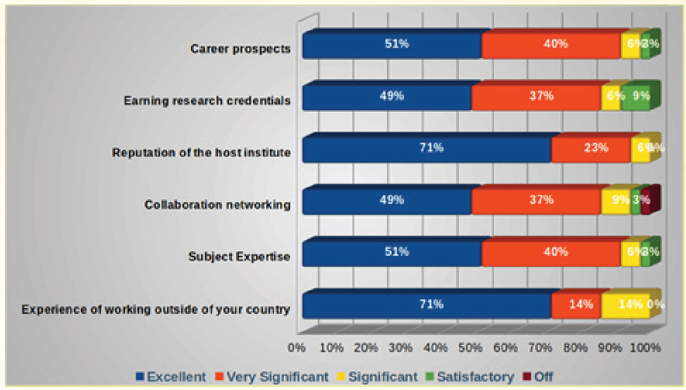


Figure 5: Percentage responses in the different dimension of value addition to the PhD fellows.

The programme has been assessed highly conducive in reaching to present position, publishing research papers, attaining international visibility, in science communication skills, and in career prospects. The impact has been highly conducive or conducive in developing co-operation network, new research collaborations, attaining awards and honors, and providing consultancy. While Lab-wise selected technologies are given in Figure 5.

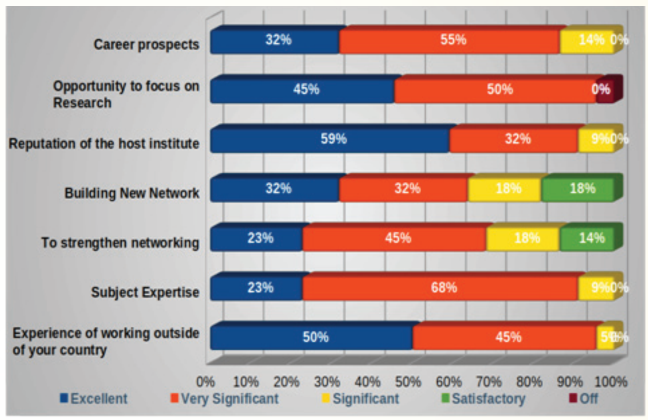


Figure 6: Percentage responses in the different dimension of value addition to the PD fellow.

Impact on Career Profile

The postdoctoral fellowship programme has been largely conducive in reaching to present position, developing co-operation network, publishing research papers, international visibility, developing science communication skills, establishing new research collaborations, career prospects, and consultancy (Fig-7).

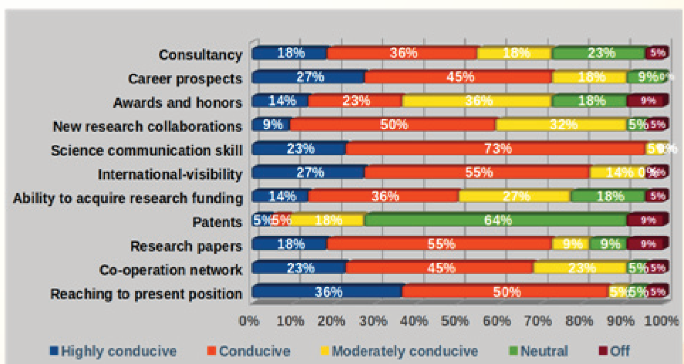


Figure 7: Percentage responses in the different dimension of career profile to the PD fellow.

Impact on the Collaboration with the Host Lab

As shown in this Fig 8, 'Joint Publications' is the major single-mode of connect between the respondents and the host, followed by 'Informally or Personal Level'. The latter is closely followed by 'Bilateral Research Projects'.

As shown in Fig. 9 Joint publications and Informally or at personal level are the most repeated modes while Student exchange and Co-organization of conference/ workshops/ research meeting.

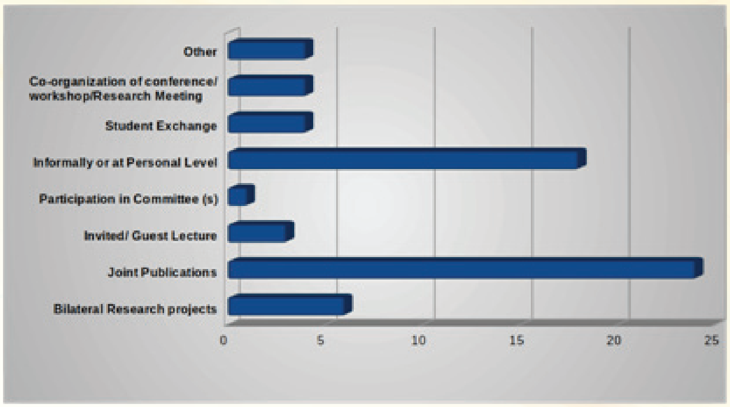


Figure 8: Bar-chart illustration of the frequency of single mode of connects with the host.

Academic Development Impact

The impact generated by this programme is that how it nurtured awardee's potential in academic and research related activities, such a researcher, referee / editor of journals, in research publications, in supervising of Ph.D./ M. Phil, or internship thesis / report, member of advisory body / research council etc., and organizer of conference/workshop/ seminar/training.

The programme has been extremely useful to nurture awardee's potential as a researcher and as a supervisor of M.Sc./ M. Tech./ B. Tech. level / project or training level thesis. The programme has been extremely useful / useful in nurturing and developing potential as a supervisor of higher level courses such as M. Phil or Ph.D., or as a referee or editor of Journals(s), and as an organizer of academic events.

The postdoctoral respondents find that the postdoctoral fellowship programme have been largely useful in nurturing their potential as a researcher, as a referee, as a supervisor (PhD / M. Phil), and as an organizer of academic events (fig-11).

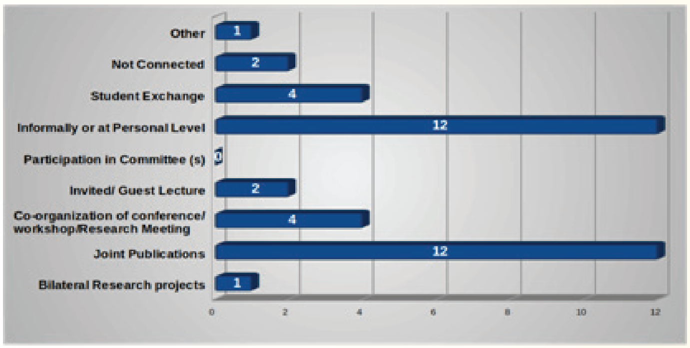


Figure 9: Bar-chart illustration of the frequency of single mode of connect with the host of the postdoctoral respondents.

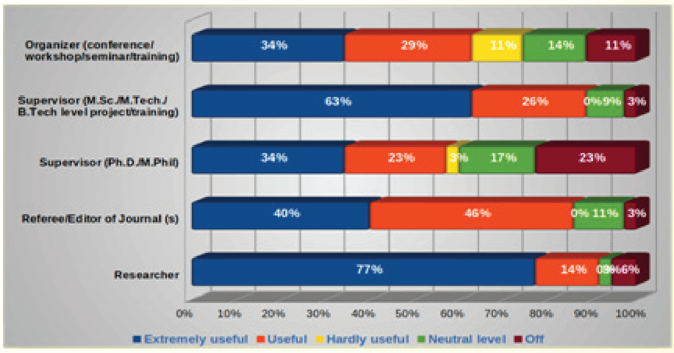


Figure 10: Results for the postgraduate respondents falling different category.

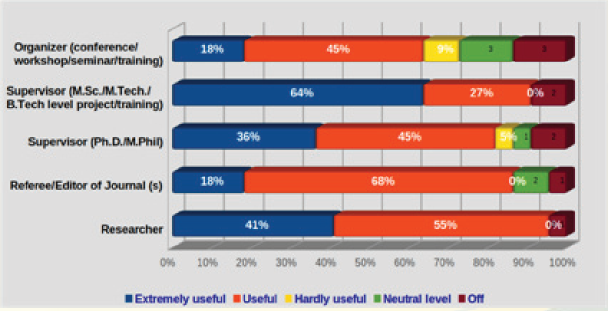


Figure 11: Results for the postdoctoral respondents against different category of academy development.

Impact on Career Development

CSIR-TWAS postgraduate and postdoctoral fellowship programmes have made substantial impact on career development, academics and research, personal aspects and on various other aspects. These impacts are imperative as these further translate to institute, R&D, industry, and society.

Responses under this category reveal that the programme has marked its impact in different roles of the career development pathways. As per the respondent dataset the impact has been substantial or normal for the roles such as departmental head or institutional head, being a member or chairperson of different committees or in administrative positions. (Fig-12)

The postdoctoral respondents find the impact of the programme Substantial or Normal on different roles in their career development pathway (Fig-13).

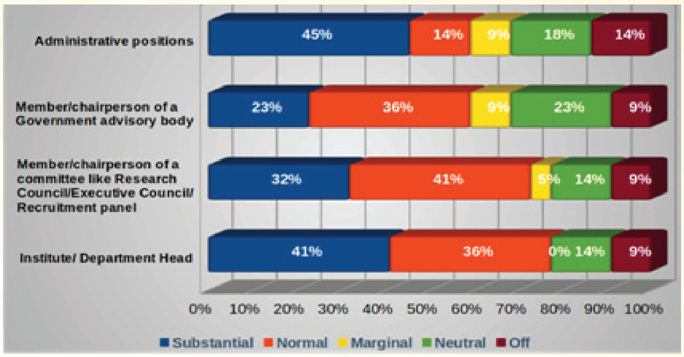


Figure 12: Illustration of the results from PhD respondent dataset

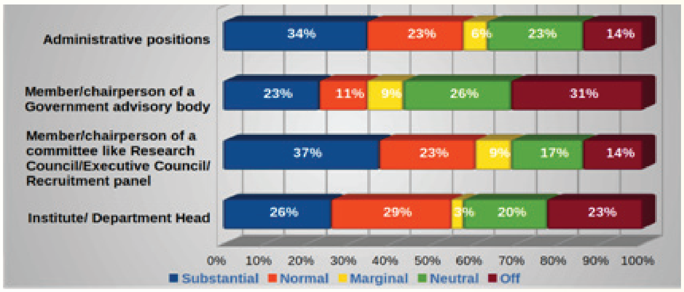


Figure 13: Illustration of the results from postdoctoral respondent dataset

Impact on Personal Aspects

Salary rise: It is observed from the postgraduate respondent dataset that there has been a salary rise for more than half of the respondents.

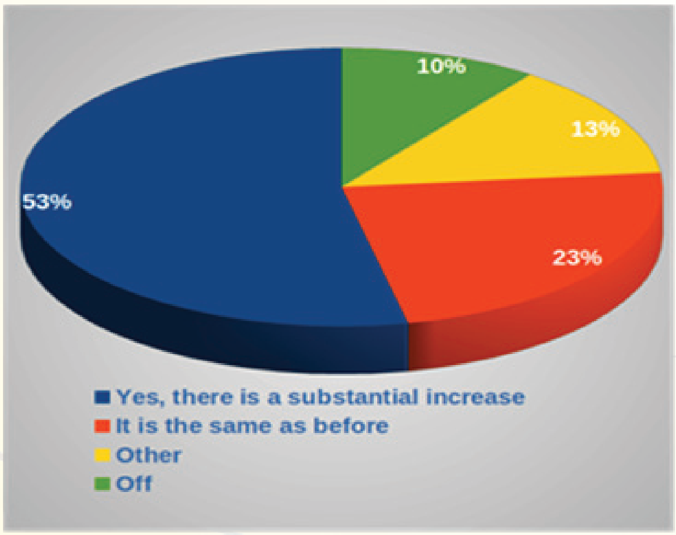


Figure 14: Salary-rise amongst the PhD respondents after the completion of programme.

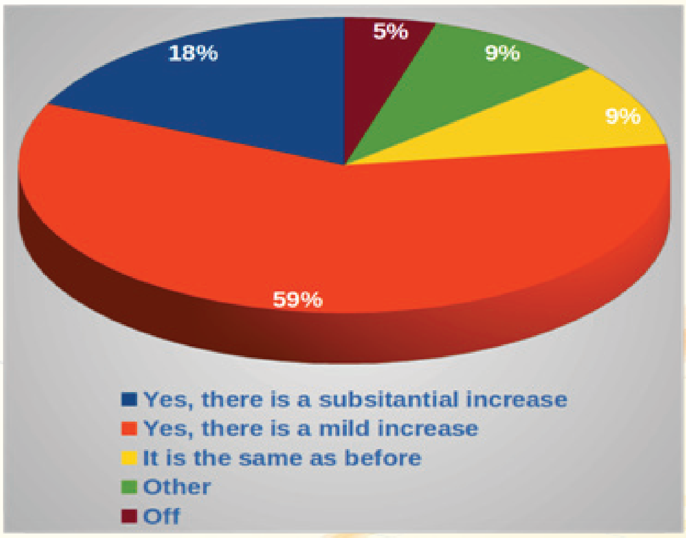


Figure 15: Salary rise amongst the postdoctoral respondents after the completion of programme.

Career growth: The postdoctoral fellowship helped the respondents in obtaining fast-track promotions while the postgraduate fellowship has been helpful to get induction as well as fast-track promotion. Most of CSIR-TWAS fellows have attained successful scientific professional positions back in their country and found CSIR technologies to be useful for implementation in their respective countries.

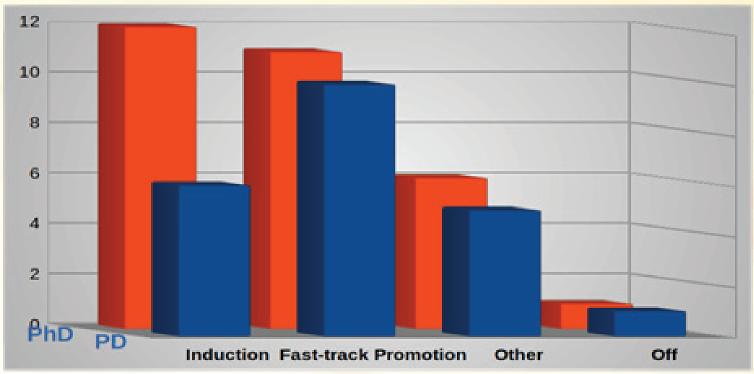


Figure 16: Impact of CSIR-TWAS fellowships on career growth

Importance of usefulness of CSIR Technologies in their countries

74% of the CSIR-TWAS postdoctoral fellows who had spent substantial amount of time in CSIR labs had opined that they would definitely recommend implementation of CSIR technologies in their country while 11% of them felt that they would most likely recommend for meeting the technological need in their country.

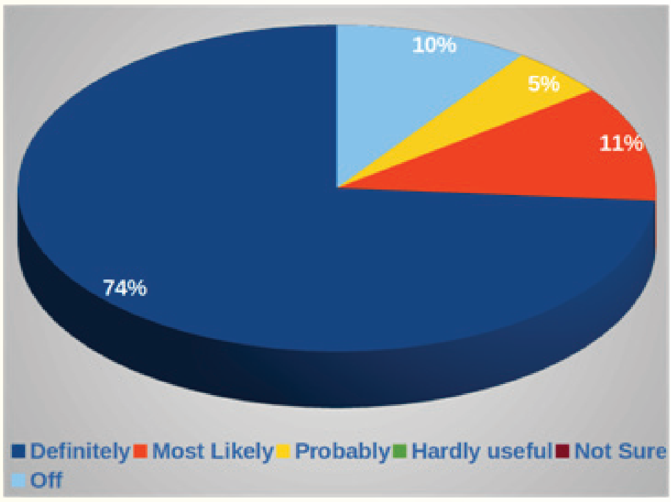


Figure 17: Usefulness of CSIR Technologies in this country by PhD fellow.

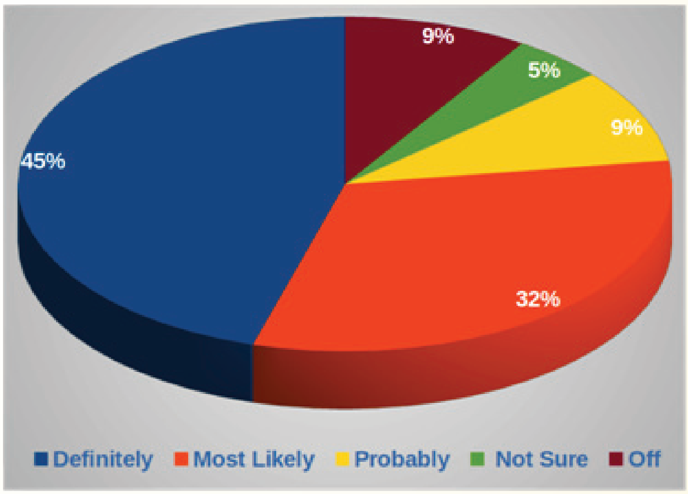


Figure 18: Usefulness of CSIR Technologies in this country by PD fellow.

Policy Recommendations

CSIR provides a platform encouraging young scholars to build-up their career via various fellowship programmes. CSIR-TWAS fellowship programmes can develop a pool and build a capacity of highly skilled professionals who may create a strong networks of knowledge exchange and work on the problems of mutual interests.

For developing nations, however, capacity building in the area of emerging and high priority technologies remains a challenge. Therefore, efficient policy measures are sought for to address S&T development challenges through collaborations and mobility of scholars among the participating countries. Fortunately in the present time, the networking among the scholars may well be set up via listserv and social media outlets for the fellowship updates, exchange of gained knowledge and divulgence of subject expertise. As suggested above, to improve the efficacy and the visibility of the assessed fellowship programmes some policy recommendations are as under:

- Incentive mechanism is needed to be introduced to encourage women participation.
- Policies needed to be identified and subsequently implemented to deal with needs and concerns of the fellows to meet the objectives of the programme.
- It is recommended to include annual activities, such as orientation programme for the new fellows.
- Feedback survey of the fellows to learn about their views about fellowship programme.
- Exit interview of the fellows after completion of the programme.
- Presence of an office, staffed by permanent employees, may provide an excellent mechanism to facilitate an open line of communication with the scholars. This may provide an independent and accessible avenue for fellows for their inputs directly to the administration.
- An advisory committee may be established for each of these fellowship programmes, with a provision of inclusion of representations from the participating labs, for reviewing, mentoring and providing inputs to the fellows.

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Vinayak and Kshitij Avinash, 'Assessment of the Impact Created by CSIR-TWAS Fellowships', CSIR-NISTADS Project Report No- NISTADS/OLP/22/2020

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