

HUMAN RESOURCE DEVELOPMENT PROGRESS TO SUSTAIN NUCLEAR SCIENCE AND TECHNOLOGY APPLICATIONS IN CAMEROON

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Abstract. Cameroon as a Member of the International Atomic Energy Agency (IAEA) has made full use of the Agency's Technical Co-operation Programme in his effort to promote peaceful applications of nuclear science and technology at national level. This paper presents the progress made in the development of reliable human resources. Results obtained have been achieved through national and regional technical co-operation projects. Over the past twenty years, the development of human resources in nuclear science and technology has focussed on the training of national scientists and engineers in various fields such as crop and animal production, human and animal nutrition, human health applications, medical physics, non destructive testing in industry, groundwater management, maintenance of medical and scientific equipment, radiation protection and radioactive waste management. Efforts made also involve the development of graduate teaching in nuclear sciences at the national universities. However, the lack of adequate training facilities remains a major concern. The development of new training/learning methods is being considered at national level through network linking of national training centres with existing international training institutions, and the use of Information Communication Technologies (ICT) which offer great flexibility with regard to the number of trainees and the actual needs.

1. Introduction

The applications of nuclear science and technology in Cameroon has been increasing since 1964 when the country joined the International Atomic Energy Agency (IAEA). Specific infrastructure has been developed in various fields, such as public health, crop and animal production, human and animal nutrition, non destructive testing techniques, groundwater management, nuclear safety with emphasis on radiation protection and radioactive waste management. The support for human resource development in these sectors was based on the assistance from IAEA through the implementation of national and regional technical cooperation projects. The growing interest of Cameroon in the use of nuclear technologies as development tools recommends the creation of the appropriate infrastructure at the national level to deal with basic training in nuclear science. Despite the beginning of specialised training programmes in some national universities, the problem remains a great concern. This article presents the evolution of the impact of the different programmes on the manpower skill development in the various applications of nuclear science and technology in Cameroon.

2. Impact of the IAEA technical assistance programme

More than 20 national projects were registered under the IAEA Technical Cooperation programme in the period 1976 – 2003 [1]. In link with them, about 50 fellowships have been approved and implemented. During the same timeframe, regional and interregional projects provided around 60 fellowships.

Under regional AFRA projects, at least 65 participants from Cameroon attended the training courses and workshops organized in the period 1992 – 2003. This number of trainees is an

indication that AFRA is playing a major role in providing training opportunities to member states at the continental level.

Figure 1 gives the numbers of fellowships offered combined with the number of participants in training events organized by IAEA in the period 1991 – 2003. The importance of AFRA projects is highlighted as a leading programme in the development of national and regional expertise in nuclear science and technology. However this trend is restricted to few domains as shown in table 1.

TABLE 1: PERCENT (%) OF TRAINEES PER FIELD OF NUCLEAR TECHNOLOGY APPLICATIONS

Non destructive testing Technique	Food and meat Production	Human Health	Radiation Safety	Others: maintenance, hydrology, Distance training, managerial skills, ..etc
10	11.4	26.8	28.9	22.8

The percentage of trainees in various sectors as shown in this table can be used as an indicator of the level of priority that prevails in Cameroon in the field of nuclear technology applications; the resulting feature is that radiation safety, human health, food and meat production, and non destructive testing technique, are given higher priority as domains bearing high potential benefits and large impacts on national socio-economic development. It is expected that other sectors such as Isotope hydrology and radiation technology will gain some importance in the near future.

The increase number of specialized manpower improves the impact of nuclear science and technology on the national development; more people are today involved in the daily activities of the nuclear medicine and the radiotherapy services at the reference hospitals of Yaoundé and Douala, as well as the staff working with the Non Destructive Testing group at HYDRAC^{1*} company is increasing since the HYDRAC implication into the construction of the pipeline Chad – Cameroon; it results from these considerations the need for promoting a specific human resource management programme and for reviewing the training strategies and methods with regard to the existing national training facilities.

3. Training in Basic Nuclear Science in Cameroon

The IAEA technical assistance programmes focus on the immediate problems that impede the satisfaction of the national socio-economic needs. The sustainable solutions include the means to ensure the availability of skilled manpower to be used in different sectors. Therefore, the national training infrastructure in basic nuclear must be strengthened.

The universities of Yaoundé-1 and Douala are involved in this strategy . Since 1987 the Department of Physics at the university of Yaoundé-1 developed a M.Sc programme in nuclear sciences. However, despite an IAEA support, there is a lack of trainers and very few students show interest in this programme.

At the University of Douala, a Doctorate School named CEPAMOQ (Centre de Physique Atomique Moléculaire et Optique Quantique) is operational since 1999 [2]. One of the missions devoted to CEPAMOQ is to promote research in the domain of atomic physics. This option opens the door to training in basic nuclear sciences. Each year 2 to 4 students are

* HYDRAC : Hydrocarbons Analyses Controls

oriented towards a master degree in nuclear physics. But here again, the infrastructure is not sufficient to train for PHD degree.

International training institutions such as the Trieste (Italy) based ICTP (International Centre for Theoretical Physics) offers alternatives to young and brilliant students for a PHD training. The implementation of these options is however limited by the number of scholarships available through external funds; it means that the national universities still need a sustainable solution to train students at high level in basic nuclear science.

IAEA assistance for the establishment of networks of theoretical and practical training activities already mentioned in Europe and Asia [3] is expected to be extended to other areas such as Africa. The regional AFRA agreement is the appropriate framework to welcome any new initiative to strengthen the training activities within the region.

The new approach is the distant learning based on information communication technologies (ICT); it is a promising solution to serve an appropriate training programme to people in developing countries, sharing the international expertise without a need for expert missions, and proposing the training programme according to the real national needs. Cameroon is participating in the regional project deal with this mater. The main constraint to the distant leaning option is the availability of the appropriate telecommunication facilities; by focussing the international efforts on this specific point, the distance learning will gain consideration and will contribute to bridge the gap between the training programmes in developed and developing countries.

4. Operational Human Resource Management

The CATEN (Centre National d'Application des Technologies Nucléaires) is the Cameroon National Nuclear Institute under the Ministry of Scientific and Technical Research. The mission of CATEN is to promote the applications of nuclear technology in the socio-economic development of Cameroon and to establish core competencies in various priority domains.

CATEN is still young and needs to be organized. The first step is the recruitment of staff; this has recently been done and CATEN has 10 newly hired junior researchers. The stability of this staff is however threatened by the long administrative procedure to complete their recruitment, the lack of attractive employment contract, the low salaries, and, not the least, the highly restricted and uncertain operating budget of the structure.

It comes from this situation that the human resource development to sustain the applications of nuclear science and technology in Cameroon needs a strong strategy plan. The Country Programme Framework of Cameroon that will support IAEA technical assistance programme up to 2007 insists on the need to train national scientists at PHD level, as well as engineers and technicians specialized in nuclear sciences [4].

It is foreseen that the newly created National Radiation Protection Agency, when it becomes operational, will contribute in the promotion of a better human resource development strategy for nuclear science and technology applications in the country. The staff of this very important Agency is expected to be appointed soon.

5. Conclusion

Human resources development is part of the national strategy plan to promote and sustain the applications of nuclear science and technology in Cameroon. Much has been done in this sector, but further development is needed. The country has made a full use of the opportunities offered by the technical assistance programme of the IAEA to get some skills trained under the different projects. More is still to be done in order to ensure the availability of the quantity and the quality of manpower needed to manage the great potential impact of the nuclear science and technology on the national development. To that end, the connection of the national training institutions to the international networks and the promotion of the

distance learning represent the promising approaches to address the lack of qualified staff. It is clear that a complete human resource development programme is to be integrated into a well organized national nuclear system of which missions are supported by a strong political commitment.