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Economic Commission for Africa
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Mission Report on the ECA Representation At the Regional Forum Women Science and Technology In Ouagadougou, BURKINA FASO 25-28 January 1999

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MISSION REPORT ON THE ECA REPRESENTATION AT THE REGIONAL FORUM WOMEN SCIENCE AND TECHNOLOGY IN OUAGADOUGOU, BURKINA FASO 25-28 JANUARY 1999

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A. Background

At the invitation of UNESCO, ACW was requested to represent ECA at the Regional Forum Women Science and Technology, in Ouagadougou, Burkina Faso, 25-28 January 1999. The meeting was attended by a number of leading African female scientists, engineers, educators and educational planners from academia, tertiary institutions and the private sector, representing many African countries. The Primary concern of Forum Women Science and Technology is to promote African women and girls participation in all facets of science and technology fields. The meeting was a prelude to the World Conference on Science for the twenty 21st Century, scheduled to take place in Budapest in June 1999.

B. Major Issues of Concern to the Conference

The gross under-representation of women in all facets of science and technology (S&T), was the main reason for convening the meeting. Among the major issues addressed was the factors accounting for the low participation of women in scientific fields and mathematics in Africa. The meeting created a lively forum for female scientists and engineers to exchange a wide range of experiences as encountered in their work places and in society. These included unsupportive work and familial environment, subtle and overt discrimination against women scientists and engineers, lack of recognition and delayed promotion and career development. The meeting reiterated the fact that generally Africa lags behind all other developing countries in human capital in this area and therefore needed giant strides to redress the gap, especially in light of globalisation and the increasing information and technology-intensive economic systems.

i. Gender Gulfs in Science and Technology

The meeting presented a plethora of data and information pointing to the low participation of African women and girls in S&T. The gap between male and female participation in these fields in Africa was one of the largest in the world. The colonial legacy of the university system still permeates the structure and ideology of contemporary African higher education institutions in which the emphasis is still, to a very large extent, on the recruitment of social elite over economic and technological functions. Most of the phenomenal expansion that has taken place in education over the past three decades has been in traditional areas of education, law, humanities and social sciences, where women preponderate. The crisis of enrolments into science and technology fields is particularly acute in mathematics, computer sciences and engineering. In most African universities, female enrolments in these fields rarely exceeds 10% and about 20-25% for the other sciences.

ii. Causes of Gender Imbalances in Science and Technology

A number of contributors pointed out that gender inequities in science, mathematics and technology related fields had little to do with cognitive abilities of female students and more with socio-cultural environmental factors. This fact is reinforced by a

widely observed phenomenon in industrial societies which is that girls and boys tend to be a par in mathematics, during the first years of schooling, and only much later do gender differences emerge after they have been repeatedly told that they are incapable of excelling in mathematics. This may explain why there are significantly more females represented in education science, frequently defined as "soft" option, especially for primary school teaching, than in pure sciences, mathematics and engineering. Female participation in practically all branches of education science is almost comparable, and in a number of instances much greater, than in social sciences and business administration.

A leading African female nuclear physicist, who holds the UNESCO Chair for Science in Africa, pointed out, as did many other contributors, that cultural factors were the greatest impediment to girls and women aspiring a scientific career. The coalescence of cultural and religious factors, which prevented girls and women from pursuing a scientific career had been greatly exacerbated by the economic contraction of the last two decades. Unemployment of science graduates further acted to discourage families from investing in the additional time and financial effort that science, engineering and mathematics training required for students. The additional time dimension is of particular import for female would-be-scientists who may subsequently have to combine a scientific career with domestic production.

iii. Initiatives to Reduce the Gender Imbalances in Science and Technology

Reducing gender gulfs in science and technology is an imperative if Africa is to participate effectively in the global economy. African women, who constitute slightly more than 50 percent of the total population, must be given the requisite background to participate in information technology. To redress the gross under-representation of women in science and technology in higher education, African countries need innovative and aggressive strategies that address the fundamental misconceptions about girls' and women's ability to undertake careers in science, mathematics and technology related disciplines. These efforts must be directed towards societies at-large but must also include strategies to encourage sustained interest of girls in science and mathematics, especially at the first and second levels of education. Curricula change to promote science for African children in general, and for female children in particular, is an imperative that cannot wait and must be integral to strategies to promote the development of science and technology in Africa. Reversing gender imbalances in science and technology will entail, among other factors, putting in place a structure of incentives for female students wishing to pursue careers in these fields, including wide-spread schemes of scholarships for female students who excel in these fields. In Summary, to promote S&T it is needed:

- National strategies, policies and legislation affecting the social, cultural and religious attitudes of parents and others towards science and technology education;
- Aggressive campaign and information at the primary school level directed at increasing the participation of girls in science;
- Innovative practices such as curricula changes, textbooks that are free of gender bias and negative attitudes towards girls and women's abilities towards S&T, guidance and counselling, and public awareness campaign;
- Improved employment opportunities for S&T graduates;

- The involvement of Non-governmental Organisations and the private sector in promoting greater participation of girls and women in science and technology;
- Increase enrolment of girls at all levels of educational ladder;
- Introduce programs to address the high levels of illiteracy among African women;
- Scholarships, bursaries and grants for outstanding girls and women wishing to pursue careers in science fields;
- Change in societal attitudes towards girls and women in science must start at home and the community;
- Policies and legislation supportive of married women who aspire careers in science, technology and mathematics; and
- Improved and wide-spread Distance Education facilities to encourage home study in S&T.

C. Conclusion

The meeting concluded by calling on member States to ensure that the above recommendations were as far as possible implemented, including formulation and implementation of coherent policies on the development of science and technology based fields. It was pointed out that data and information on girls' attainment in science was seriously inadequate and that this extended to women scientists in Africa. The meeting adopted a **Declaration and a Plan of Action** to guide future national, sub-regional and regional strategies to increase the percentage of women scientists, mathematicians and engineers. **The Declaration of Ouagadougou on Women, Science and Technology in Africa for the 21st Century**, appealed to the Director General of UNESCO to support the **Regional Plan of Action** by contributing to its financing and implementation. The international partners and NGO community were also requested to assist in financial mobilisation to promote the development of African women and girls in science and technology.

GENERAL REPORT.

Under the Patronage of his Excellency Mr Blaise COMPAORE, President of Burkina Faso, and under the aegis of UNESCO, has been hold in Ouagadougou, Burkina Faso, on January 25,26,27,28, 1999 a Regional Forum of Africa on the topic « Women, Science and Technology ».

The objective of this forum, organised as prelude to the « World Conference on Science for the XXIst Century » that will take place at Budapest in June 1999, was to deal with the promotion of women in science based careers, but also the scientific and technological education of young girls, and more generally the acquisition, by the majority of women of a scientific and technical culture which is essential for any real participation in economic activities and social life.

The forum has brought together African science specialists, representatives of governments, non government organisations, Associations of Women Scientists, and industry. About sixty persons from forty two (42) countries have attended this forum : Angola, South Africa, Benin, Botswana, Cameroon, Congo Brazzaville, the Democratic Republic of Congo, Ivory Coast, Djibouti, Erithrea, Ethiopia, Gabon, Gambia, Ghana, Guinée Conakry, Guinée Bissau, Guinée Equatoriale, Kenya, Lesotho, Liberia, Mauritania, Mozambique, Namibia, Nigeria, Niger, Uganda, Central Africa, Sao-Tome et Principe, Senegal, Sierra Leone, Seychelles, Sudan, Swaziland, Tanzania, Tchad, Togo, Zambia and Zimbabwe. The Economic Commission for Africa (ECA) was also represented.

I. Opening Ceremony

- The opening ceremony chaired by Mr Christophe DABIRE, Minister of Secondary, Higher Education and Science of Burkina Faso, was characterized by two important speeches.

- In the first speech, Mrs Renée Claire, representative of the General Director of UNESCO, announced that states must from now on commit themselves in favour of scientific and technological development to serve humanity, and that the role of women in this new view of the relations beween science and society is of cardinal importance.

The forum of the region of Africa is the fourth one after that of the regions of Latin-America and the Caribbean, Europe and Asia. The forum of the Mediterranean region is not held. The forum of the region of Africa is particular for two reasons : The low participation of women in the scientific and technological development on the one hand and the vast potentialities for change Africa has on the other hand.

During his opening ceremony speech, the Burkinabe Minister of Secondary and Higher Education and Scientific Research underlined the importance of this forum, due to the fact that it allows us to identify and define the possibilities of a change of mentalities in order to allow women to acquire scientific knowledge, to participate in their development and to draw profit from the development out-come. He appealed to the participants to make sure that this forum, of which they are the genitors, gives rise to recommendations and resolutions which engage the Governments, the International Institutions, and the Inter Governmental institutions in concrete actions capable of changing people's life.

After the opening ceremony of the forum and the opening of the exposition on « Science and Technology in Burkina Faso », the forum programme was adopted and the forum board was constituted : It was composed as followed :

President : Mr Mamadou SISSOKO (**Burkina Faso**)
Vice President : Pr S.UPUCHANE Sisai (**Botswana**)

Rapporteur : Prof. Denise Houphuet-Boigny (**Cote d'Ivoire**)
Assistant Reporter : Mr Joseph O'Connor (**FEMSA**)

II The Forum Workshops

The forum workshop was held through panels, each panel being characterized by a series of communications followed by debates and proposals.

The first panel : Women, Science and Technology : A Stake for Africa.

In a communication entitled : « Scientific and Technological Training of Girls in Basic Education in Africa », Hon. Alice Tiendrebeogo, Minister for Promotion of Women of Burkina Faso, emphasized the low rate of girls schooling in Africa and the differential attitude of teachers to boys and girls. She also pointed out that handbooks perpetrate preconceptions with a sterotyped image of women. According to these preconceptions, women's contribution to the economy is insignificant depriving, the girls of female positive examples. Parents are not confident of their daughters capacity, and Science and Mathematics are considered as male subjects.

The discussion on the paper revealed that women's presence in the domain of Science and Technology is necessary if Africa wants to participate in the world economy. It has also been underlined that Governments must support the actions of Women Science Associations. They must also struggle to improve the level of educational systems in favour of science and technology.

Second panel : Scientific Education

1) « **Science Education for Girls : Beyond the Secondary School** » by Professor ADAM Aba, Head of Department of Physics of the University of Science and Technology, Kumasi, Ghana.

2) « **From Rhetoric to Action : the FEMSA approach to promote the participation and performance of girls in SMT** » by Mr Joseph O'Connor, Regional Coodinator, FEMSA.

3) « **Scientific Training of Girls in Burkina Faso** » by Mrs OUEDRAOGO/BANSE Aminata Elisabeth, President of the Association of Scientific Women of Burkina for the Promotion of Scientific and Technological Training of Women.

After the different communications, we can assert that the school statistics in most African countries are characterized by a low rate of girl's schooling. Girls are also poorly represented in scientific careers. The situation gets worse and worse when we move from basic education to secondary education, and from secondary education to higher education. The historical backwardness of girls is caused by the following factors.

- Socio-cultural factors

In the family unit first and then in the society, parents have not understood yet that girls have the same abilities as boys, and therefore scientific education must be part of their basic training. The girl is not trained in the same way as a boy and is less encouraged to specialize in scientific and technical careers. Victims of ***reserved domains***, they cannot fully take part in the development of the continent.

- Economic factors

In the current situation of economic crises, when there is a choice to be made as to children schooling, parents do not hesitate to send the male child to school, confining in this way the female child to the household, to money generating activities, to take care of the family, and to forced or early marriage.

curriculum development, teacher education and examinations at the primary and secondary school level. At the school and community level interventions will concentrate on a number of key areas :

- sensitisation and awareness building for students, teachers and parents of the problems faced by girls in the learning of SMT.
- Motivational activities to promote girls interest in SMT and provide information on the importance of SMT in their lives after school and on the kinds of careers open to girls in SMT.
- Building teacher capacity, developing girl-friendly teaching methodologies, and designing diagnostic processes to reveal girls' problem areas in the study of SMT and the design of appropriate remedial modules.
- Using the teachers themselves and the schools to develop appropriate teaching materials and other resources available in typical primary and secondary schools.

6. An imporant aspect of the FEMSA approach will be to disseminate as widely as possible throughout the region information on successful interventions, research findings and other initiatives to improve the participation and performance of girls in SMT.

- In Burkina Faso, State Institutions and Associations (Direction for the Promotion of the Education of Girls, the Coordination of Reflection and Action for the Education of Girls, FESCIFA/PRESCITEF, AFCI-B.) have been set up to show the displayed will of everybody to work for the development of girls' schooling in general. Specific actions have been taken to advise girls on scientific careers.

The discussion on the papers confirmed that in almost all the African countries represented at the forum of Ouagadougou, there is a real awareness of the situation and actions are being taken to improve the scientific education of girls.

- Scientific societies in Gambia.

- Experimentation of micro-science and micro-chemistry in the educational approach in Cameroon,

- A University for Women and the use of local langages as in the teqching of science in Sudan, a country where girls training in science are more numerous than boys.

Third panel : Research and Technology

During this panel, the following communications were made.

1) **Science and Technology : New Perspectives for African Women** by Mrs Isabelle Tokpanou, former Minister, President of Science Women Cameroon and of FAWECAM.

2) **Beyond Attraction : Women and Careers in Science**, by Prof. Eunice A C Okeke, University of Nigeria and African Region Representative on CASAT Board

3) **Women Science and Technology** by professor Grace A..Adele, Vice President of Third World Organisation of African Women in Science Ref : Nigeria (IWONS).

4) **Women and Scientific Education : the case of Higher Education in Ivory Coast High** by Prof. Denise. HOUPHOUET-BOIGNY.

5) **Participation of Women in Science Based Careers in Southern Africa** Professor F. MPUCHANE Sisai, Dean at the Faculty of Science of Botswana University .

6) **Engineer Women of Mali** by Mrs Salamata Fofana GAKOU, President of the Engineer Women Association of Mali (EWA).

7) **Women in Scientific Careers in Burkina Faso** by Doctor Clementine DABIRE/BINSO, in charge of research at INERA.

After the different communications we can point out that :

- the access of African women to scientifc and technolgical careers is very difficult because of many obstacles and traps.
- The deeply phallocratic attitude of society which Africa must get rid of, if it wants to develop with the help of its women.
- The lack of social and gender equality.
- The inequal chances for access to schooling.
- Girls dropping out school because of their inability to reconcile family requirements with those linked to their training or careers.
- The lack of female models to encourage effectively girls who choose these difficult careers.
- The information and the diffusion of the strategies for change by the media.
- High level scientifc careers take a long time so women prefer short scientific careers which end up in jobs.

The different papers brought out :

– The inability to reconcile family requirements with those linked to careers.
+ Lack of prior information on the requirements of the professions.
+ Low wages and very few additional benefits compared to their colleagues in other fields who are less trained than them. These reports have been concretely confirmed by real examples in Ivory Coast and South Africa.

- Women are generally under represented in the science teachers community and among researchers in sciences. That is how in science related to health, the number of female teachers with tenure does not exceed five (5), the majority of women are assistant professors.

- In university departments the average of assistant professors is 9%, Assistant Lecturers 7.5%, Senior Lecturers 10% and Teachers remains weak.

- In scientifc research, there is no woman as Head of Research. They are all Assistant Researchers.

- The examination of the data on the presence of women in scientific careers in Southern Africa reveals that, although the percentage of girls sent to school at the basic and secondary level exceeds that of boys, they are not more present in scientific careers. This tendency is clearly shown at the high level where women are more present in Biology than in hard sciences such as Physics and Engeneering. The reasons are numerous.

- We can quote the socio-cultural restraints, the drop out, the absence of women in important positions, the cost of education.

In the discussion which followed, the members of the forum acknowledged that the different problems aroused concern in the whole of Africa. Therefore it was agreed that the forum must contribute to aking states take into account the unexploited resources represented by women. The number of scientific female teachers must increase to enable women to be real models for their students and pupils. In the same way, female researchers must popularize technologies for the female populations.

Fourth Panel : Professional Training

The following communications made :

1) **Professional Training of Women in the Textile Industry in Kenya** by Dr Dinah W. TAMATI, Department of Textile, Clothing and Design, Kenyatta University, Kenya.

2) **Professional Training of Girls and Women in Burkina Faso: Results and Future Prospects,** by Mrs Zourata YAMEOGO, Inspector of Secondary and Professional Education.

3) **Jobs in Solar Power** by Doctor Emmanuel NANEMA. Head of the Department of Energy , IRSAT-CNRST

4) **Women and Non-formal Education** by Mrs Sabine ZIGANI, Representative of WAGGS, World Association of Girl Guides and Girl Scouts.

These communications showed that the textile industry in Kenya, as well as the textile industry in many African countries and all over the world, gives many jobs. The majority of the workers are women who are unskilled or a less skilled workers. But since this industry is witnessing change and the introduction of new technology, it is necessary to train all the workers.

To promote this sector and to create more technical jobs for women it is necessary to put emphasis on their education and training. To achieve this, it is necessary to elaborate and to work out training programmes for girls so that they should be well prepared to seek for skilled jobs in the industry in general. These training schedules will emphasize the scientific subjects such as Mathematics and the concept of self employment. As far as professional training is concerned, the participants have noticed the weakness of the supply in comparison to the increasing demand, the lack of qualified teachers in training institutions, but also the insufficiency of equipment, and overcrowded classes. They have also talked about the difficulties young girls come across in their employment at the end of their training. Therefore it has been decided the working out of a programme of information and communication enphasizing the diffusion of new technologies and the introduction of the concept of self employment within the training programmes in order to help qualified women to take up individual initiatives.

The forum has also noticed the action of girl guides and girl scouts in Education, especially in the protection of the environment. The training provided in scouting gives great importance to scientific and technical education. To carry out all these training programmes, girl guides and girl scouts are supported by international institutions such as UNICEF and UNESCO. Girl guides and girl scouts act also in favour of the environment. Solar energy has also been said to improve rural women's conditions of life.

The different communications aroused interesting debates related to non formal training of girls and literacy. The development of distance education in the domain of science and technology was also discussed.

III Continuation of the workshops and the closing ceremony

After the hearing of communications and the different discussions that have ended up with many recommendations, the forum completed its final workshop.

The closing ceremony, chaired by His Exellency Mr Christophe DABIRE, Minister of Secondary, High Education and Sciences of Burkina Faso then followed.

DECLARATION OF OUAGADOUGOU

On women, science and technology in Africa for the 21st century

From Rhetoric to action

- Preamble

We the participants to the regional forum « Women, Science and Technology » that was held in Ouagadougou, Burkina Faso from January 25 to 28, 1999, in prelude to the world conference on science for the 21st century, having examined the critical situation in the continent and in particular of women, characterized by the poor schooling of girls, hardly one girls out of four in age to be sent to school is proceded with schooling in many countries

- The high percentage of illiteracy as far as women are concerned, particularly in rural areas where most of the time six to nine women out to ten don't know how to read and write.

- The poor general level of scientific and technical culture in the society,
- The absence of real scientific policies
- The insignificant presence of women in scientific and technical careers, and in decision making professions, due to the poor schooling of girls, loss and other factors, limiting, within the established systems, and also in the organs of decisions. Taking into account the structural misfunctioning linked to the rampant many-sided crisis since several decades, to which me must to the add various conflicts which go on devastating Africa, and the main victims are women, children and the aged.

We decide to commit ourselves and think out in a different way, the place and role of women in African societies so that they could fully participate in the development of the continent.

- To stray from the beaten track

It is question first of all to move from rhetoric to action, to stray from the beaten track,that have finally led to a no through rod. In fact,
- The negative influences of some socio-cultural factors conditions the little girl, the women in established roles.

- The continuation of schedules which hardly take into consideration the integration of the results of science and technology.

-The implementation of inethodology mainly based on memorization;
- The enforcement of non formal education methods which do not rely on the enhancement of the learners

The unsuitability of the policy of trainers training and in particular tearchers.

The presence of legislative texts and arrangements in accordance with the regulations which hamper the promotion of women in general and of women in science and technology in particular. That is why we should choose a new perspective.

- To make the difference : A historical duty

We, the participants to the forum we commit ourselves with all our sisters of the continent to make the difference. It is a historical duty considering the changing African societies.

Six main ideas have led us in our processes. To increase the standing of the scientific and technical endogenous potentialities. African women, from generation to generation have knowledge, know-how, and have idea how to behave in society in various domains, from traditional pedriatics to traditional medecine, the less aesthetic.

- To promote non formal education, increasing the standing of women, through the reinforcement of suitable scientific and technological contents by opening out their potentialities.

- To get to the parity of scientifics classes
- To urge Governments to promote scientist women in decision making posts
- To reform all the curricula and training programmes by taking into account the present day challenges like on environment, health, by adapting the to the interests of boys and girls.
- To set up a new partner ship for the promotion of African women and girls in science and technology

In putting to work these important ideas, we the participants want to rally all the society interest (Governements, communities associations, civil and scientific associations in these fundamental demands

The materialization of the principal ideas will be done through a regional plan of action « Women Science and Technology » which fundamental objective is to contribute to the qualitative transformation of Africain societies by permitting women and men to work jointly for development. Emphasis must be put on the promotion of women for scientific careers and also on the scientific and technological education. Women must also been brought to acquire a scientific and technological culture.

Beyond these constructive propositions we, the participants are aware that facing the stakes of globalisation and the challenge due to poverty intolerance, arbitrary, African societies must do a qualitative jump. In other terms African societies must go ahead go ahead.

Change the present life for african renaissance

The present life of the majority of Africain populations and also of by the majorite of African women is not what is expected. They are aiminig at a necessary change of this daily life for a new renaissance . This is why we the participants are rallied in communion with all the society to change our present life for a real African renaissance. We are convinced that Africa can suucceed if it puts together : ethic, talent, resources and culture.

Far from accomplishing this alone, Africa will enrich with universsal human experiences cooperation in solidarity.

By changing the present life we will contribute at the same time to bring the peace needed by all the humanity in general and by Africa in particular.

In considering these orientation within the new partnership in favour of the promotion of women and girls in the domain of science and technology we, the participants appeal to :

African states

We appeal to African leaders to work out resolutely policies on the promotion of girls and women in the domain of science and technology through the setting out of qualitative transformation statistics of the society

UNESCO
We appeal to the General Director of UNESCO to bring a partnership support to the regional plan of action « Women, Science and Technology in Africa ». (WSTA) by contributing to its financing and implementation

We also appeal to help collect ressources in order to achieve the objectives of the promotion of women in science and technology, and also the distribution of the works of the forum.

To the International scientific community

We request all the world scientist to reinforce the cooperation in favour of the humanity in the respect of the biothic and biodiversity..

- We call on for a support as to initiatives in favour of women and girls in science and technology

- We call on all the scientific comnunity to consider the world conference as an only moment where science, technology, peace, progress and equality will be at the appointement.

To the partners of development

We request all the partners of developnent to give priority to the scientific and technical contents suitable in the conception, the implementation and evaluation of projects and programmes of development. We call on particularly to invest in the promotion of women and girls in science and technology.

To NGO and local Associations

We request them to effectively participate in the new scientific and technical vision as to non formal and formal education and to contribute to actualize and spread out endogenous knowledges.

We the participants to the regional forum « Women, Science and Technology », think that we must act, and act fast and well. We want in that way, thanks to innovation and anticipation conqueer our future which is also that of the whole society.

Adopted in Ouagadougou in January 28th, 1999.