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REPORT
OF WORKING GROUP OF EXPERTS ON HOUSE-BUILDING COSTS
(Tangier, 1-12 September 1969)

169-2501

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I. GENERAL REPORT OF THE MEETING

Terms of reference

1. African co-operation for solving problems related to house-building costs was included in the recommendations made by the eighth Session of the ECA (E/CN.14/393). The first meeting of experts on house-building costs was held in Addis Ababa from 23 to 29 April 1968 for the East African Sub-region (Report E/CN.14/416).

2. At its ninth Session the ECA by its resolution 209(IX) established a work programme for the Housing Section of the secretariat for 1969-1973 (E/CN.14/447, projects 54-58). Project 56 of this programme includes:

"The meeting of Experts on House-Building Costs held in 1968 recommended the establishment of working groups on a sub-regional basis to keep under review trends in house-building costs and measures for cost reduction. The following specific sub-projects will be undertaken during the quinquennium:

(a) Meeting of Experts

(i) North African meeting of Experts on House-Building Costs (1969);

(ii) West African meeting of Experts on House-Building Costs (1970);

(iii) Central African meeting of Experts on House-Building Costs (1971).

These meetings will be held jointly with bi-lateral donors. The Centre for Housing, Building and Planning will collaborate with the Housing Section in running these meetings."

3. Accordingly the ECA, through its Housing Section and its Sub-regional Office in Tangier, has invited North African governments to appoint members of a North African Working Group of Experts on House-Building Costs. The members of the working group, appointed by the governments, met in Tangier from 1 to 12 September 1969.

Attendance

4. Eleven experts from six North African countries attended the meeting together with one representative of the WHO and two consultants, one from Bouwcentrum (Netherlands) and one from An Foras Forbartha (The National Institute for Physical Planning and Construction Research, Ireland) (see Annex II).

Opening of the meeting

5. The meeting was held in the ECA Sub-regional Office in Tangier.

6. The meeting was opened by Mr. A. Ben Abdelmoumen, Director of the ECA Sub-regional Office on 2 September at 10.30 a.m., in the presence of Mr. Y. Hamza, Secretary General representing H.E. the Governor of the Province, and invited guests.

7. Mr. A. Hajjaji (Morocco) was elected Chairman of this meeting; Mr. A.E. Louis Atallah (UAR) was elected Vice-Chairman; Mr. A.H. Abdalla (Sudan) and Mr. Mahmoud Ben Alaya (Tunisia) were elected Rapporteurs.

8. The provisional agenda was adopted after revision (Annex III).

Background papers

9. Besides Housing in Africa (United Nations Publication Sales No. 66.II.K.4), the ECE study Housing Costs in European Countries (ST/ECE/HOU/8), Proposal for a Study of Construction Costs in the Central American Isthmus (E/CN.12/CCE/SC.4/26) and Building Classification Practices (CIB report No.6), which had been studied by the experts in Addis Ababa in 1968, the Working Group used the following papers as working documents:

- (i) Report of the meeting on House-Building Costs, Addis Ababa, 23-29 April 1968 (E/CN.14/416);
- (ii) Standard Questionnaire for Low-Income Group Housing in ECA member countries (E/CN.14/HOU/16/Rev.2)

- (iii) Methods of Cost Assessment in Low-Cost Housing (E/CN.14/HOU/45) which had been prepared by the Secretariat on the basis of paragraph 37 of the Report of the Meeting on House-Building Costs, Addis Ababa, 1968;
- (iv) Building Research and the Use of Knowledge in Practice (E/CN.14/HOU/46) which had been prepared by the secretariat on the basis of studies made by Bouwcentrum, Netherlands.
- (v) Relation between Cost Coding, Bills of Quantities, Standard Specifications and General Information Services (E/CN.14/HOU/47), which had been prepared by the secretariat as a follow up of the Addis Ababa recommendations.

Country contributions

10. All the participating delegations contributed to the meeting by delivering information on low cost housing schemes according to the Questionnaire E/CN.14/HOU/16/Rev.2. The information from Libya, Sudan and the UAR, which was received before the meeting, had been analysed by the secretariat and presented on standard information sheets as recommended by the experts in Addis Ababa. These information sheets were presented in the document A Review of Country Monographs (E/CN.14/HOU/48). Similar information by the delegates of Morocco and Tunisia will be included on the standard information sheets continuously prepared and published by the secretariat for ECA members.
11. Each delegation delivered a report of the situation in their country in respect to Housing and Housing Costs. These reports will appear as ECA publications under the numbers E/CN.14/HOU/48/Add.1 to Add.6.
12. The participants enjoyed the demonstration of an audio-visual performance prepared by the Service de l'Urbanisme et de l'Habitat du Ministere de l'Interieur, Rabat, Morocco, for the promotion of aided self-help housing.

13. In relation to E/CN.14/HOU/48, the Working Group discussed possibilities of comparing costs in different countries. It was felt that translation of local currency into US dollars did not give a true picture of national building costs as related to the annual income of the user. The secretariat had proposed that a defined labour-wage should be used for comparison. After discussion the Working Group recommended that the building cost of a house should be related to the lowest annual income group for which the house had been designed.

Contribution by Consultants

14. The two consultants representing Bouwcentrum and An Foras Forbartha reported on the work of their Institutes. The Bouwcentrum contribution was distributed as an ECA working document E/CN.14/HOU/46, and an Foras Forbartha contribution carries the title "Cost Analysis for Price Reduction in Low Income Group Housing". Mr. Shanley promised that this contribution would be translated and distributed within a fortnight after his return to Ireland. An Foras Forbartha contribution is designated E/CN.14/HOU/46/Add.1.

15. It was noted that Mr. Dijkgraaf has contributed, not only by attending the meeting, but also by a preparatory visit to each country during the month of July. His contributions were made possible by generous financial support of the Netherlands' Government.

Study of methods of cost assessment in low-cost housing

16. The experts, having read the "Report of Meeting of Experts on House-Building Costs", (E/CN.14/) and "Methods of Cost Assessment in Low-Cost Housing" (E/CN.14/HOU/45) - discussed the possibility of adopting a joint method of cost analysis in all countries of the sub-region as a basis for future co-operation.

17. The secretariat introduced the subject by referring to earlier development in the field of cost-coding.

18. The CLB (Internal Council for Building, Research, Studies and Documentation) had in 1966 recommended the "SfB System" for elements and works as a basis, among others, for cost-coding. The meeting of experts in Addis Ababa had adopted this recommendation and included a graphical presentation of this system in its report (E/CN.14/416, page 15) (Fig. 1)^{1/}. However, the experts meeting in Addis Ababa did not find a solution to the problem of how studies of cost-factors on the site could be integrated in the general lists of prices and works.

19. The secretariat illustrated the present situation (Fig. 2)^{1/}. Above the diagonal line in the drawing are illustrated the owners' concerns and activities including design and preparation of contract documents. Below the line are illustrated the concerns and activities of producers including all operations on site. It would be the task of the experts to:

- (a) decide whether the recommendations of the East-African experts would be applicable in North Africa;
- (b) find the best way of translating cost-factors into work-prices and to link design and production for a joint effort to make the integrated design-production process efficient and more economic.

20. The secretariat emphasized that one of the aims of applying standard methods for cost-coding would be to supply reliable price lists for building elements to be used by architects for cost comparison of different proposals for the same housing project. It presented a model card for an information card-file on prices of building elements (walls, roofs, etc...) arranged according to the SfB system (Fig. 3)^{1/} for this purpose.

21. On this card, references were made to other card files for prices of construction works (brickworks, plaster-works, etc...) of which building elements are made. These prices for construction works (Fig. 4)^{1/} are now known from priced bills of quantities; only in a few countries has there been a thorough study of the cost-factors (especially the quantity and price of labour involved) which constitute the base for the price. Without knowing the relations between cost-factors and work-prices, rationalization for cost-reduction seems to be impossible.

I/ Please see Annex IV

22. One of the advantages of adopting the SfB system for cost-coding on site as well as for price-listing of construction works and building elements would be the direct relationship between construction operations (labour and machines), building products and construction works which is the basic idea of this system.

23. The main use of this system is for cost-coding by constructors and for an identical arrangement of items in specifications and bills of quantities, thus securing good relation between design considerations and the reality in execution (E/CN.14/HOU/47).

24. Whatever system the experts may choose for their co-operation, however, an organization will be needed in each country which will carry out research on cost and cost-reduction and publish the results, and an officer in each of these organizations to effect liaison within the sub-region and with other regions. The research organizations will have to work continuously to keep information up-to-date by the publication of adequate indices.

25. After the presentation of the method, the following questions were asked:

- (a) how widely exploited is the system;
- (b) how is it used in the preliminary design stages of projects;
- (c) how useful will it be as a means of reducing costs.

26. The system is widely in use in Scandinavia and other countries like Yugoslavia. It has been translated into French by the CSTB, the Director of which is the President of CIB. The system is under study in Great Britain and France, and there is a decision, in principle, in the Bouwcentrum that the system be used in their studies.

27. There has been no detailed studies of how the system was used in the preliminary design of projects. The main use of the system is for cost-coding by contractors and for identical arrangement of items in specifications and bills of quantities.

28. It was apparent from the discussions that there was no common system for cost analysis in the countries of the sub-region. The merits of having a unified system were appreciated and it was felt that the adoption, at a later stage, of a unified system was desirable in the sub-region. The Working Group agreed to make a recommendation to that effect (Recommendation No. 2).

29. The experts then discussed simplified methods of cost assessment in the preliminary stage of design as described in E/CN.14/HOU/45 paragraph 3(d). Several methods based on m^2 floor area are in use. One expert proposed another method taking into account the meter length of walls, the surface of floors and roofs and the amount of services and equipment. It was agreed that simplified methods of cost assessment are important for basic decisions in the programming of housing schemes, and the experts recommended that studies of such methods should be included in the future work of the Working Group.

30. After giving thorough explanation of the contents of E/CN.14/HOU/47, the secretariat requested that table D1 of Appendix 3 should be filled in so that one copy indicated building materials resources available in commercial quantities and the other copy showed the products actually used in each country of the sub-region. The experts agreed to do so and requested that extra copies of the tables should be provided by the secretariat.

31. It was agreed that a relation and interaction between different working documents for house-construction, illustrated by appendices 1 and 2 to the paper, are essential. The exact methods of achieving such relationship, however, must be decided upon after the studies of the system as such have been concluded.

32. It was emphasized that an integrated system of this kind must also cater for the contractors' accounting and costing procedures. Contractors should, therefore, be involved in the studies to ensure that the full benefits of a comprehensive classification system for contract documentation would be achieved.

Standardization of building components

33. After the presentation of the basic principles of modular co-ordination, it was pointed out that the basic ideas of modular co-ordination started as "system building" in which various contractors had their own dimensionally co-ordinated components. System building had obvious advantages but no two systems were compatible. The need for a unified approach by which all the dimensions would be compatible was therefore evident.

By such an approach, it was pointed out that:

1. waste was completely eliminated in time, labour and materials by ensuring that all operations on site are directly productive;
2. since the products fit exactly in place, building and repairs were much easier and much cheaper;
3. if the approach is accordingly accepted there is a much bigger market with the consequent reduction of costs.

34. Therefore international organizations such as CIB and ISO and the relevant bodies of the United Nations, after studying the problem in detail, recommended modular co-ordination in building and the standardization of building products. The module agreed on is 1 dm. as described in TAO/GLOBAL/4.

35. After discussion, the Working Group agreed to recommend the adoption of modular co-ordination on this basis (see Recommendation 3).

Other factors affecting prices of dwellings

36. It was recognized that many factors which could not be influenced during the design and construction stages of a project, have a major effect on the final economic result of the implementation of a housing policy. Basic decisions, such as the physical planning, location of a housing area and the provision of services are such factors, as are the location and efficiency of building materials industries.

37. It was also emphasized that no rationalization will take place as long as there is not enough skilled manpower at all levels; an efficient training programme is therefore an indispensable part of overall approach to cost reduction.

38. Until such time that the skilled labour force has been built up, it is essential to encourage the use of the initiative and present ability of the people themselves to build up their own houses. An increased application of aided self-help methods was recommended.

39. After a full discussion, it was agreed that a sound housing policy based on a comprehensive and integrated plan was essential. Within this framework, measures conducive to cost reduction such as provision of suitable land, services, institutions of housing finance and aided self-help schemes should be considered. The meeting made a recommendation to this effect (see Recommendation No.4).

Closing of the meeting

40. The meeting was closed with addresses by the Chairman and the Vice-Chairman thanking all involved.

II.

RECOMMENDATIONS

The Working Group, after reviewing the items on the agenda and the related working papers, agreed to pass the following recommendations on low-cost housing to the sub-regional office of the ECA for further action by the Governments of the Sub-region and by the ECA secretariat.

Recommendation 1

The continuation of the work of the experts on house-building costs in the North African Sub-region

The Working Group of North African Experts on House-Building Costs meeting in Tangier 1-12 September 1969 recommends that the Working Group on House-Building Costs becomes a permanent institution with the aim of promoting improved methods of cost analysis and cost reduction in the field of the production of low-cost housing. For this purpose:

- (i) There should be, in each country of the sub-region, an organization (centre) selected or established by the government, to deal with research and documentation in all fields which may influence the cost of housing; these national organizations, therefore, should include a wide range of expertise - either directly or by organized affiliation - from socio-economic and industrial planning to supervision of work on site; it should be able to carry out functional, physico-economic and techno-economic studies in the field of housing (see doc. E/CN.14/HOU/46).
- (ii) There should be two persons, with expert knowledge in housing, appointed by each government to be members of the Working Group. The Working Group will be the co-ordinator of work to be carried out by the organizations (centres) mentioned above (i).
- (iii) The Working Group should arrange the exchange of information on work programmes and in reports on housing and related activities, by correspondence and by meetings.
- (iv) The Working Group should be the adviser to the governments involved through the sub-regional office of ECA on matters within its competence, and the ECA through its sub-regional meetings in the member countries of the sub-region on a rotating basis (in average every second year), in rendering secretarial services, and in obtaining technical assistance.

Recommendation 2

Adoption of a joint method of an analysis for cost-reduction

The Working Group of North African Experts on House-Building Costs meeting in Tangier 1-12 September 1969 recommends that the North African countries adopt one joint system for building classification and cost coding, preferably linked to an international system:

- (i) The Working Group appreciates the recommendations made by the meeting of Experts on House-Building Costs, Addis Ababa 1968 (E/CN.14/HOU/416) and recommends that the system agreed upon by the East African experts be studied for adoption also in the North African Sub-region after the adjustments which may be necessary, particularly for language reasons.
- (ii) The Working Group strongly recommends that ECA make available the services of a suitable expert to advise the countries of the sub-region in this respect.

Recommendation 3

Modular Co-ordination

After studying the document TAO/GLOBAL/4 "Modular Co-ordination in Housing" and appreciating that this publication is based on an international recommendation by CIB, ISO and the UN, the Working Group of North African Experts on House-Building Costs meeting in Tangier 1-12 September 1969 strongly recommends standardization of dimensions of building components based on a module of 1 dm.

Recommendation 4

Governmental basic decisions influencing the cost of housing

The Working Group of North African Experts on House-Building Costs meeting in Tangier 1-12 September 1969 draws the attention of the governments to the necessity of establishing a well defined long term housing policy based on a comprehensive socio-economic planning. Such policy should include inter alia:

- (a) national, regional and local physical planning and its efficient implementation; the development of land for house-building at the right place and at the right time;
- (b) the expansion or establishment of institutions of house-building finance to increase the assistance for those in the low income groups, and the promotion of co-operative housing movements;
- (c) the promotion of aided self-help housing methods in rural as well as in urban areas where suitable;
- (d) the planning and promotion of a suitable building materials industry based on indigenous raw materials;
- (e) a training programme for a sufficient quantity and quality of skilled manpower at all levels.

ANNEX I

LIST OF DOCUMENTS PREPARED FOR THE MEETING

Background documents:

E/CN.14/HOU/7/Rev.1	Housing in Africa
E/CN.14/HOU/17	Report of the Meeting of Experts on House-Building Costs, Addis Ababa, April 1968.
E/CN.14/HOU/16/Rev.2	Standard Questionnaire for Low-Income Group Housing in ECA Member Countries.
TAO/GLOBAL/4	Modular Co-ordination in Housing
TAO/LAT/53	Proposal for a Study of the Construction Costs of Housing in the Central American Isthmus
ST/ECE/HOU/8	Housing Costs in European Countries

Documents prepared for the Working Group

E/CN.14/HOU/42	Provisional Programme of Work
E/CN.14/HOU/43	Provisional List of Documents
E/CN.14/HOU/44	Provisional List of Participants
E/CN.14/HOU/45	Methods of Cost Assessment in Low-Cost Housing
E/CN.14/HOU/46	Building Research and the Use of Knowledge in Practice
E/CN.14/HOU/47	Relation between Standard Specifications, Bills of Quantities and Cost Coding.
E/CN.14/HOU/48	Country Monographs

English-speaking countries

- Add.1 Libya
- Add.2 Sudan
- Add.3 UAR

French-speaking countries

- Add.4 Algeria
- Add.5 Morocco
- Add.6 Tunisia

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ANNEX II

LIST OF PARTICIPANTS/
LISTE DES PARTICIPANTS

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ANNEX III

WORK PROGRAMME

Tuesday, 2.7.69

Morning

Registration of participants

Opening statements

Election of officers

Afternoon

Introduction of the subject

Opening discussions

Drawing up of the final work programme

Wednesday, 3.9.69.

Morning

Presentation of country and consultants' monographs

Contribution by English-speaking countries:

Libya

Morocco

Tunisia

Afternoon

Contribution by:

The National Institute for Physical Planning
and Construction Research, Dublin, Ireland

Bouwcentrum, International Information
Centre for Building and Housing,
Rotterdam, The Netherlands

Papers:

E/CN.14/HOU/46

E/CN.14/HOU/47/Add.1

E/CN.14/HOU/48

E/CN.14/HOU/48/Add.1 to 6

Thursday, 4.9.69

Morning

Methods of cost assessment and recommendations
for improvement:

- Materials and components
- Labour, tools and machines

Afternoon

- Organization and overheads
- Design considerations
- Standard specifications, bills of quantities
and methods of accounting

Papers:

E/CN.14/HOU/45

E/CN.14/HOU/47

E/CN.14/460
E/CN.14/HOU/51
Annex III
Page 2

Friday, 5.9.69

Morning

Other factors influencing prices of dwellings:

- Land, town planning, infrastructure and services
- Finance, administration, maintenance
- Co-operative and aided self-help housing

Optimal quality and cost reduction

- Research. The integrated approach
- The development cycle method

Afternoon

Standardization of building components:

- Modular co-ordination
- Component standards to be recommended

Papers: E/CN.14/HOU/46

E/CN.14/HOU/47

TAO/GLOBAL/4

Saturday, 6.9.69

Morning

Summary statements

Future co-operation

Agreement on documentation methods

Directives for the report

Afternoon

Free

Sunday, 7.9.69

Excursion

(Editorial Committee preparing report)

Monday, 8.9.69

Checking and amending the draft report

Tuesday 9 and

Wednesday 10.9.69

Reserved for possible delays

ANNEX IV

EXPLANATIONS TO THE REPORT

Words used in the report

- HOUSE** : Any house, dwelling or other unit for living, whether single, grouped or in blocks of flats.
- BUILDING** : One built up secluded unit under roofing.
- PLOT** : The area surrounding the building(s) and forming one real estate unit together with it.
- PART (OF A BUILDING)** : An identified major part of a building (e.g. west wing, garage, basement, second floor etc.).
- ELEMENT (OF A BUILDING)** : Any functionally defined constituent of a building (e.g. wall, floor, roof, door, window, etc.).
- Elements are indicated by bracketed numbers in the SfB. (e.g. (31) = window).
- (CONSTRUCTION) WORK** : The result of a specified construction process defined by the character of the main product used (e.g. concrete work, block work, plaster work, paint work). Each element of a building is made of a certain number of works. A wall for instance may be made of concrete-block work + plaster work + paint work. Works are arranged in the SfB in main groups indicated by capital letters, (e.g. E = concrete work, F = block work, P = plaster work, V = paint work).
- (BUILDING) PRODUCT** : Anything manufactured for use in a construction work. Products are of two kinds: formless products such as cement, gravel, paint, etc. and components, which have been shaped for building purposes. Components may be general components, such as blocks, tiles, sheets, bars, etc. which are used for general construction works, or

special components, such as prefabricated windows, doors, stair-units etc., which will be installed as elements of the building.

The building products are grouped in the SfB in the same way as the works for which they are produced (indication capital letters, e.g. E = products for concrete works, F = bricks and blocks, P = plasters, V = paints, G = prefabricated structural units (special components) for erection works, X = prefabricated non-structural units (special components) for installation works, etc.).

(CONSTITUENT) MATERIAL is the substance of which the product is made, e.g. stone, burnt clay, metal, wood, etc. Materials are arranged in the SfB in groups indicated by lower case letters (e = natural stone, g = burnt clay, h = metal, i = wood, etc.).

(CONSTRUCTION) COST FACTORS are those expenditures in the construction process which together make up the net cost of any work (management costs and profit not included). There are three main groups of cost factors: PRODUCTS (price on site). LABOUR and PLANT (including machines, tools, scaffoldings, temporary huts etc.). The cost of a product is the sum of values added to the natural resources used, by extraction, manufacturing and distribution (see fig.1). Costs for the constructor's management (including profit), the architect's design and the owner's administration have to be added to the sum of all net costs of works but they are not considered as construction cost factors.

PRICE

as distinguished from COST is what the buyer has to pay. It should be observed that prices of products normally are much higher than the sum of the costs for extraction, manufacturing and distribution due to irregularities in the process of production and marketing. Also prices for works in bills of quantities and related price lists are mostly market prices, not truly expressing the costs of products, labour and plant involved.

OWNER (Fig.2) : is the one for whom a building is being constructed. The owner normally will be responsible for the ADMINISTRATION both of the project as a totality and of the annual running of the building(s) when completed. The owner may be a person, or any kind of organization (e.g. governmental agency, housing corporation, housing co-operative, etc.).

ARCHITECT (Fig.2): is any person or team of persons who makes the DESIGN of building(s) for the owner. The design includes all preparatory work necessary for construction such as research, drawings, specification, bill of quantities and documents for tendering and contracting.

CONSTRUCTOR (Fig.2) is the organized unit(s) (whether contractor(s) or a part of the owner's organization) responsible for the MANAGEMENT of the construction process. Construction management includes the organization of all site operations and the supply of products labour and plant necessary for the works required for the building(s) including works on the plot.

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