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THE ROLE OF GOVERNMENT AND SEMI-OFFICIAL ORGANIZATIONS
IN THE FIELD OF INDUSTRIALIZED BUILDING

(Prepared by the Ministry of Housing, Copenhagen)



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/I. INTRODUCTION

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I. INTRODUCTION

This paper deals with methods by which government (central and/or local) can promote the development of industrialized house building. The statement is based on Scandinavian (mainly Danish) experience, and ways and means not used in these countries will be mentioned only briefly. Problems connected with building codes, standardization, modular co-ordination, research and information which are highly important instruments for the development of the building industry and where governments play an important, if not decisive role, are not taken up here as they are being dealt with separately.

II. CENTRAL GOVERNMENT

1. Central government as client/investor

In countries with centrally planned economies, the majority of houses are designed, constructed and administered by government agencies. This procedure, of course, gives the government the maximum power of guiding the development. Often, in these countries production of building components is heavily concentrated in big plants and standardization carried very far. Advantages of mass production are obvious, but the risk of large scale failures is also present. The amount of technical and organizational skill in the government agencies must be considerable, if reasonable results shall be obtained, and once obtained, comparison and evaluation of the prices and qualities of the products (the houses) is subject to a number of difficulties.

Similarly, in Western European countries, for instance France, the Central Housing Authority has entered the field as investor, collaborating directly with contractors and placing large orders with component producers. Full control of design and execution is maintained, and a price/quality comparison can be undertaken because many other forms of organizational set-up exist simultaneously. Still, the government authority must be very well equipped with technical and managerial skills, in order to deal directly on an equal footing with big private firms. And if a big

/government order

government order has induced the firm to invest heavily in new machinery and no economies are obtained, the government organ will find itself in a troublesome situation with respect to the future existence of the firm in question.

In Denmark, the central government and the local governments rarely stand as investors in the housing field. In the public building sector, however, enormous possibilities exist with respect to the promotion of prefabricated building techniques. These possibilities have up till now mainly been utilized in the field of school-building and the construction of soldiers' barracks.

2. Direct government financing and government finance guarantees

In the Nordic countries of Europe, government loans for house building has played a decisive role in post-war years. The system of government loans has been instituted either because the private capital market has not been able to furnish capital in forms suitable for house building (i.e. long-term and at a reasonable rate of interest) or because the government has wanted to carry through a policy particularly aiming at the promotion of housing, for instance in the form of financing at very low interest rates.

The various procedures of government financing will not be described here, but only those aspects which touches upon the governments possibility to guide the development in the house building sector. It goes without saying that if government loans are the only means of financing available in the country, and if the loans are granted on reasonable terms, these possibilities are the greatest. This was the situation in Denmark 1946-1959 and is still true, for instance in Norway. The Government Housing Agency can enforce all types of requirements, technical and economical, as a condition for the granting of loans. In Denmark, a number of technical requirements over and above those found in the existing building codes and bye-laws were enforced in this way, among other things standard floor to floor height, better equipment and insulation standard, etc.

/With the

With the Danish Housing Act of 1958, the system of government loans for house building was replaced by a system of government guarantees for loans from newly created private mortgage institutions. These institutions are also entitled to grant loans without government guarantee, the only difference being that guaranteed loans cover 85-94 per cent of the value of the estate while non-guaranteed loans normally cover only 75 per cent as a maximum. Interest rates, repayment periods, etc. are the same for the two loan types. The advantage of this system in relation to the loan system, seen from the point of view of the government, is that the burden of providing capital (normally charged through the issuing of bonds) is transferred to the mortgage institutions. The system is gratis, so to say. The disadvantage is that a guaranteed loan can be substituted by a non-guaranteed if the investor can provide the extra initial capital himself, meaning that the guarantee system in its present form is a weak instrument for guiding the development in the building industry. Some modifications must be added: the government guaranteed loans are normally supplemented by subsidies of various kinds, making them more attractive. Secondly, the non-profit sector where an initial capital contribution of 25 per cent or even 15 per cent cannot normally be demanded of the dwellers or be provided elsewhere, has mainly to rely on government guaranteed loans.

The fact that the open capital market offers financing possibilities which are nearly as attractive as those offered by the Central Housing Agency means that innovations or modifications of the building practice are difficult to carry through as a condition for government aid. This was seen in Denmark after 1959 where, for instance, cost control for government subsidized one-family houses proved to be too severe, and investors preferred private loans to avoid this control, even at the cost of slightly more unfavourable loan conditions.

The enforcement of technical requirements places a heavy responsibility on the technical department of the Central Housing Agency. Danish experience, however, indicates that the staff need not to be very great, if the work is properly arranged.

/In Denmark,

In Denmark, the procedure can be summarized as follows:

In the first instance a preliminary application with draft designs, but without prices is forwarded to the Ministry of Housing through the local authority. If funds are available and if the project seems to comply with requirements and is economically looking, these detailed designs, descriptions and prices are "ordered" by the Ministry of Housing to be submitted at a certain date. This means that the client can be reasonably sure of having his project realized, and if not, to have his design costs reimbursed. The final project is then scrutinized by the Ministry's technical departments, improvements sometimes suggested and a cost control carried out. This control is based on a system of plus or minus points in relation to the price of a theoretical standard house with calculated, up-to-date prices and is not very time-consuming for traditional housing. For houses built by industrialized or partly or partly or fully prefabricated methods, price control is more difficult because it has not - hitherto - been possible to agree on the selection of a "standard" prefabricated house. Comparisons with traditional housing can be undertaken, but differences in quality makes the job difficult. Normally, in recent years, the quality of the prefabricated houses has been better and more uniform.

When the project is finally approved, the State aid is granted and - not until this time - the construction work may begin; among other things on the condition that no changes must take place underway. This condition may sometimes prove too severe and may be dispensed with, but normally such changes are relatively very expensive. This is even more the case with industrialized building methods where any break in the construction rythm costs excessively. During the construction period, the building site is inspected periodically by the Ministry's technical consultants to ensure conformity with the approved plans.

3. Government subsidies

By a subsidy is here understood all forms of annual (monthly) payments from the housing authority to investors, builders, building material producers, tenants, etc. Subsidies may also be given in the

/form of

form of a once-for-all interest and amortization free grant. A subsidy may also be indirect or concealed, for instance tax or interest rate reductions. Thus, subsidies can take on a thousand different shapes which is not of major interest here. The important thing is that subsidies, if attractive enough, can be - and have been - used to give priority to one set of construction methods in favour of other methods. Such selective subsidies may be relatively easy to administer. If, for instance, skilled labour is short, greater subsidies can be given to projects where only a minimum percentage of skilled labour is used. If bricks are scarce, building methods without bricks can be preferred and awarded. If subsidies are made still more selective, difficulties may arise. It may be unwise to grant special subsidies to building systems making use of, for instance, room-sized concrete elements, if this would bar the way for the development of systems using smaller elements or other materials which may prove as economically in the longer run.

It is worth mentioning that, in Denmark, building techniques have developed towards industrialization without special or selective subsidies from the public. The cost-quality control applied for government subsidized housing has - as far as possible - been undertaken according to the same principles whether the project in question was designed in the traditional ways or according to industrialized or pre-fabricated methods. Some deviations from this principle have been necessary. For instance, the planning and design process when introducing a new industrialized building system is far more time consuming and expensive than when traditional methods are applied. These extra costs have been approved, among other things because savings were to be expected in design costs when the system has been tried out. Such savings, by the way, have not always materialized, the reasons not being quite clear.

But as a whole, industrialized building methods after a period of uncertainty have proved definitely competitive in this country in spite of the small housing market, particularly in the capital where the labour cost is at highest. One of the reasons for this is not of

/technical origin,

technical origin, but a so to say normal link of the inflationary process known all over the world: during the inflation prices of labour will, in most cases, rise more than prices of materials, machines and equipment. Therefore, a building system using a small proportion of labour will automatically, in the course of time, find itself in a more advantageous position than some years earlier.

4. Government long-term programmes and long-term guarantees

As mentioned above (II 1 and 3), the Danish system of government loans, guarantees and subsidies has not been used to carry through a "selective" policy with respect to "prefab" or "traditional" projects. Only badly designed and uneconomical projects have been rejected, whether designed according to industrialized or traditional erection techniques.

The only privilege yielded by the government to the establishment of an industrialized building sector consists in the long-term programmes for industrialized house building. These programmes are described to some detail in "Industrialized Building in Denmark" and only some main points shall be mentioned here.

(a) The programme embrace (since 1966) 7,000 dwellings annually - corresponding to about 18 per cent of the total production or about 30 per cent of the total production of rental dwellings - and is a five-year, rolling programme revised annually (i.e. 1965-1970, 1966-1971, etc.).

(b) When a certain project is placed on the programme, this means that it is guaranteed to receive a starting permit at an agreed date (or dates) within the coming five years.

(c) It further means that the project will receive the normal government aid, according to the Housing Act in force at the starting date.

(d) The public aid has (hitherto) been the same as for traditional housing.

(e) Draft designs must be approved by the Ministry before admission. Suitable land must also be available.

/(f) The

(f) The projects must be based on advanced, industrialized building methods, but no restrictions as to type of system, choice of materials, etc. are enforced.

The obvious purpose of a programme of this kind is to ensure continuity for the development work of planners and designers, building material producers and contractors. Most countries have experienced severe oscillations in the building activity and/or restrictions of the building activity imposed by government for various reasons. Such restrictions - or even the possibility that they will be put into force - have a destroying effect on investment activity among building component producers and may, in any case, induce them to invest on a smaller and perhaps, in the long run, uneconomical scale. When - on the other hand - a reasonable activity can be secured for a five-year period, production plants can be amortized in such a way that prices of the products will not become non-competitive just because of high amortization costs.

It could be argued that the five-year guarantees should be given to component producers since they need them most, and not to investors (mostly non-profit housing societies), as the case is in Denmark. But this would give existing firms a strong monopoly and hamper the establishment of new, maybe more economical production plants. In fact, five-year guarantees have been given to projects based on components not yet in production. After the preliminary approval, the investor - either by tender or in other ways - will try to find somebody to produce the component (s) in question. In most cases, however, negotiations with the producer in have already taken place. It is a fact that during the regime of the long-term programmes in Denmark, a number of new factories have been established, producing entirely new products or using quite new methods.

Whether these plants would have been established in any case as a result of enormal evolution or whether their establishment is the outcome of deliberate government policy, is a question that cannot be definitively answered. It is without doubt, however, that most of these new firms have come to stay, independently of future government measures.

5. Other government measures

Large scale land ownership is a powerfull instrument of guiding building policy. If land is scarce, national or local government can set up extremely strict conditions for selling or letting. An example of this policy is described under III. The central governments in the Nordic countries have not pursued this policy in the housing field.

Another means by which public agencies can promote rationalization within the building industry is through the issuing of certificates (agreements) as to quality and/or price for type designed plans for dwellings. In the 1958 Housing Act, a provision was inserted saying that the Ministry of Housing could authorize credit institutions to - on behalf of the government - issue State guarantees for loans for housing constructed in accordance with approved type designs.

This provision has only been utilized in part. Thus, the Ministry of Housing has approved some ten type-designed one-family houses (with variations). The approval means that all legally prescribed technical requirements are met, and further that the house must be considered to meet utility requirements set up for a modern one-family house of middle size. As for the price of the houses, the Ministry has confined itself to cite the price information received from the applicants and to ascertain that the house can be constructed within the maximum limit for construction costs fixed in the Housing Act as a prerequisite for public aid. The approved houses can thus be built with or without public aid on equal footing with individually designed houses, but the technical scrutinizing by the authorities concerned is supposed to go very smoothly in the case of the type-designed houses. It has not been possible, however, to delegate the granting of State guarantees to credit institutions which would have meant a considerable reduction of the administrative work.

The reason for this lacking fulfilment of the Act's intentions is twofold:

Firstly, the decentralization of the authority to grant State guarantees would conflict with the centralized overall house building programme.

/Secondly, the

Secondly, the fixed maximum limits for construction costs prescribed in the Housing Act makes the whole system less tempting for builders, when it is held in mind that possibilities of construction without State aid - and without maximum limits - are quite advantageous.

A further difficulty connected with the approval of type designs is that a certain amount of subjective evaluation will be needed. This places a heavy responsibility on the authority which shall approve (or reject) the projects. Another solution may be to give a mere description of the technological and functional qualities of the project, in so far as this is possible in exact terms. The value of a description of this kind, however, is probably less than that of a formal approval.

III. LOCAL GOVERNMENT

The local government can promote and guide development in much the same way as the central government, depending on its administrative and financial powers. To describe the various measures will, therefore, more or less be a repetition of the foregoing section. Instead a short description will be given of a large scale scheme of recent origin, initiated by the City of Copenhagen.

This plan which is by far the greatest and most ambitious programme for prefabricated housing hitherto seen in this country, was put before the City Council in 1963 and comprises around 20,000 dwellings to be erected over a 10 year period.

An important feature in the new plan is that the 20,000 dwellings are going to be erected on a relatively small number of sites - less than 10 - in order to utilize the economies of mass production to the highest possible degree.

Another important feature is the reshaping of the traditional structure of the building team. The municipality will stand neither as a builder nor as the owner of the completed houses, but will enforce its influence through the municipal ownership of the land, in the form of conditions for sale or letting of the sites. One of the most important of these conditions is that the municipality will want to deal with

/only one

only one or two organizations which, on their side, shall take care of the whole building process, from the first stage of design to the date of delivery of the completed dwellings. As founders of these new organizations the plan aims at the non-profit or co-operative housing associations. For some of the other big plans for prefabricated housing a close collaboration between several non-profit housing associations has taken place, but only on an ad hoc basis.

In accordance with the intention of the plan, two such "unity organizations" have been formed, both with a number of the already existing non-profit associations as major stock-holders or partners, to take care of the design work, the planning of the deliverances, the assembly work, etc. and, if it is deemed necessary, the production of a smaller or a greater part of the building elements. Thus, the organizations deliver a finished product developed by the organization itself on the basis of the experiences gained from earlier prefabricated housing projects in which many of the founders of the new organizations have taken part.

A schedule has been set up as for the division of the production of houses between the two organizations for the 10-year period, but it is the intention that a greater part of the production may be placed with the organization which achieves the best results, and that other organizations eventually may enter into the plan.

The other requirements set up by the municipality deserve mentioning as they are a good deal more far-reaching and detailed than the requirements in the normal client-builder relation.

Firstly, it is a condition that the building process be carried through under the highest degree of industrialization practically applicable. Secondly, a number of functional requirements is set up, for instance as to areas of sitting rooms, bed rooms, kitchens, kitchen equipment and sanitary equipment, etc. A functional description of quality standard has also been considered but as this is not possible with the existing terminology, it has been chosen to include descriptions of existing materials and working processes. These descriptions, however, are not binding for the builder, as it is not the intention to curtail his possibilities to choose new materials and/or processes complying with the quality standard for which examples are given.

The integration

The integration of the investor/builder/administrator function has obvious advantages, such as easier co-ordination and, thereby, rationalization of the whole planning and building process. Certain disadvantages may appear, however. Thus, the control of prices, qualities and execution of the construction work which, normally, is undertaken by the architect (the engineer) on behalf of the investor is now left to the unity organization itself. The controlling function is placed inside the organization, not outside as it ought to be. This emphasizes the demand for the feeling of responsibility within the organization and the need for a deep-going public control. A further discussion of these problems falls outside the scope of this paper.

IV. NON-PROFIT HOUSING ORGANIZATIONS REGIONAL PROGRAMMES

The house building sector in the Scandinavian countries is heavily influenced by the non-profit housing organizations and these organizations have also taken the leadership in the introduction of modern building techniques. The organizational form of the non-profit organizations varies, but three main types may be distinguished: housing co-operatives, in which the members (tenants) are shareholders and have direct influence on the running of the society; the second group comprises joint stock companies which have frequently been founded by trade unions or co-operative construction firms; and thirdly, the so-called self-governing associations which often are operated in close connection with the local authorities. The members - the tenants - also have a certain amount of influence in the running of the two latter types.

Many small societies collaborate with special management organizations during the planning and construction period so that the administration of the house is first taken over by the local society on completion. In this way, during the construction local interests are combined with the experience and greater technical knowledge of a nationwide organization.

/As regards

As regards the possibilities of obtaining government aid, no distinction is made between the various types of non-profit housing associations. Among the most important conditions required for such aid may be mentioned that the aim of the society shall be the production of housing which meets the requirements of the lower- and lowest-income groups of the population and that the statutes and annual accounts of the housing societies must be approved by the Ministry of Housing which also may appoint supervisors. In the statutes it is laid down that profits, if any, shall be set aside for the construction of new dwellings or for the improvement and modernization - but not ordinary maintenance - of existing houses instead of being paid back to tenants or shareholders.

A draw-back of the non-profit housing sector, in its present structure in Denmark, with respect to industrialized house building is that many of the organizations are quite small and not able to cope with housing projects on the scale where economies of mass production begin to operate. The policy of the Danish Ministry of Housing has, therefore, been not to approve the establishment of new housing societies of this kind. On the contrary, the Ministry has encouraged societies, both the small and the bigger ones, to merge or pool.

Some organizations have been reluctant to give up their traditional independency, but others have understood the necessity to collaborate in some form or other, in order to be able to undertake more extensive building schemes. Important initiatives leading towards collaboration have been taken by the Joint Federation of Danish Non-Profit Housing Societies, in particular as concerns smaller or middle-sized provincial towns. In localities of this kind, a production in the course of one or two years of, for instance, 1,000 dwellings according to the same system and with more or less the same appearance, would completely dominate the townscape. Furthermore, in smaller towns where the housing shortage is not urgent, many of the dwellings would stand empty for shorter or longer periods.

This problem can be solved without loss of "economies of scale", if a number of local non-profit housing societies in various towns agree on a programme allotting, for instance, 300-600 dwellings to each town, according to a fixed time schedule and utilizing the same building system.

/A regional

A regional programme of this kind has its limitations. As it will normally be necessary to set up new production plants, these can be given an optimal location, i.e. for instance in the centre of the region. But if the region is thinly populated with considerable distances between towns and a not too well built out road or railway system, transport costs may outweigh savings in production costs. It is not possible to give an exact statement on the maximum transport distances, but much more than 80-100 km from the factory to the site could not be allowed with the existing techniques. The more man- and machine-hours having been put into the components in relation to their weight (resulting in complicated ready-to-use components), the higher transport costs can be borne without spoiling overall economy. With new and lighter materials - plastics, aluminium - the picture may change completely.

Another limitation to the kind of regional programmes dealt with here, is the problem of employment for local contractors and local labour. If a small town engages in a prefabricated housing programme covering maybe 50 per cent of its normal housing production for a period of some years, the need for local labour in the building sector will necessarily decline drastically. With some building systems it is possible to use local labour for some operations, but as the consumption of man-hours on site to a high degree has been replaced by man-hours in a factory maybe 50 kilometres away, the problem will not be solved in this way.

That this by-product of industrialized building has not developed into a serious problem in Denmark is due to the following reasons:

The overall economic situation has been favourable, most branches of industry and trade being characterized by a shortage of labour.

The high level of activity in the building industry.

The growing flexibility of the labour, i.e. easier transfer from one trade to another.

The increased mobility of the individual workers due to motorization.

The increasing amount of repair and modernization work, normally undertaken by smaller local firms using traditional methods, due to the increased housing stock and to the rising living standards of the population which again means an increased demand for modern facilities and up-to-date equipment in the dwellings.

/Creation of

Creation of (or increase in) unemployment in connection with the introduction of industrialized building methods is a problem which falls outside the scope of this statement, but which, nevertheless, deserves much attention. It has been mentioned in connection with "regional programmes" because it will, probably, prove more acute in smaller towns than in the big cities with their wider range of employment possibilities.

V. CONCLUSIONS

This paper has been discussing certain methods which public or semi-public agencies can apply in order to - on a voluntary basis - form the framework and promote the industrialization of the house-building sector. Different forms of government aid and subsidies have been described and commented upon, and special mentioning have been made of long-term programmes of various kinds. Danish experience proves that a certain amount of stability on the house building market - or part of it - is a necessary prerequisite for the establishment of a house building industry proper.

Further, experience from many parts of the world shows that the availability of skilled technicians and well equipped production plants is not enough to secure the break-through of industrialization. These are only links (important links) in an overall process in which other agencies of more administrative character - public, semi-public and private - are involved. If these agencies do not exist or if communication among them functions ineffectively, any approach towards industrialization is deemed to failure.