

Chapter I

PROBLEMS OF DEFINITION OF URBAN POPULATION

1. Before proceeding to a projection, it is necessary to examine the definitions according to which data on "urban" and "rural" population have been determined. Under some definitions, for instance, "urban" areas remain within constant geographic boundaries, and "urban" population, so defined, can grow by births, deaths and migration only. According to some other definitions, the geographic extent of "urban" areas can expand continuously; in such a case, the "urban" population grows by area reclassifications as well as by births, deaths and migration.

2. Definitions of "urban" localities vary from country to country, and within the same countries from time to time. In some countries, moreover, two or more definitions are maintained side by side. Urbanization being both a quantitative and qualitative process, different criteria of "urbanism" gain or lose relevance as time progresses.

3. A bewildering variety of criteria have been used, singly or in combination, to define "urban" localities.²⁷ Essentially, the definitions are mostly of the following types: administrative, economic and geographic. The type of definition must be ascertained when a projection is made since it determines whether or to what extent "urban" populations can also grow through reclassification of areas previously defined as "rural". Different types of definition, moreover, can be suitable according to the purposes which the forecast is intended to serve.

ADMINISTRATIVE DEFINITION: TYPE OF LOCAL GOVERNMENT

4. In many countries the minor territorial administrative units have local governing bodies of diverse forms or degrees of authority, making obvious the distinction of those which are of an "urban" type. The administrative boundaries of urban local governments then contain the population defined as "urban", all other areas being classed as "rural". The effects of such a definition vary, however, depending on the relationship between administrative area and the area built up at an urban density, and depending also on the frequency with which administrative boundary adjustments may occur.

5. The administrative area can be said to be "under-bounded" where there are additional, immediately adjacent, densely built-up areas outside the administra-

tive boundary, such areas as may be called suburbs, possibly including administratively separate towns which have come to form conurbations. The administrative area can be said to be "over-bounded" when it is more extensive than the densely built-up area and includes also some population settled at much lower densities. The administratively "urban" population can thus be smaller than the population inhabiting urbanized terrain, and in some instances it can also be larger. The extent of coincidence between the two depends largely on administrative flexibility and on the speed with which built-up areas have expanded geographically. The administrative reforms in Japan in 1953, for instance, have had the effect that most cities, which previously were rather "under-bounded", suddenly became "over-bounded" with reference to contiguous built-up areas. As a consequence, 37.5 per cent of the population were classified as "urban" in the 1950 census, as against 56.3 per cent only five years later, at the census taken in 1955. While undoubtedly the urban settlements gained population rapidly in that period, the apparent growth would not have been so extraordinary if the administrative areas had remained the same, or if "urban" population had been defined on the two occasions in geographic or other terms.²⁸

6. Countries vary considerably in the territorial flexibility of administrative areas. In some countries, local administrative boundary adjustments are made very rarely if at all, in others they happen from time to time, and in still others they occur with great frequency. This concerns both the recognition of additional areas as "urban" (through establishment of a new local government of an "urban" type) and the geographic expansion of existing "urban" areas through annexation of surrounding terrain previously under "rural" forms of government.

7. Where administrative boundaries remain unchanged, the growth of population in densely built-up areas is not fully reflected by the increases noted in the population of administratively "urban" areas. This is especially the case where, with urban growth, there is an increasing overspill of urbanized settlement beyond the administrative city limits, as happens generally where the city

²⁷ For a brief survey of definitions of "urban" population in the censuses of 123 countries taken around 1960, see *Growth of the World's Urban and Rural Population, 1920-2000* (United Nations publication, Sales No. E.69.XIII.3), pp. 7-10.

²⁸ The 1955 census of Japan included a table showing the 1950 population within areas classified as "urban" in 1955. In all, 53.5 per cent of Japan's 1950 population inhabited the "urban" areas of 1955. The comparison of figures suggests that between 1950 and 1955 as much as 16 per cent of the population of Japan were reclassified from rural to urban, and that between 1950 and 1955 the "urban" population ratio rose only slightly. However, without doubt, effectively urbanized areas within the "urban" areas of 1955 expanded significantly within the 1950-1955 period, a circumstance not reflected in this comparison of percentages.

is "under-bounded". In many countries there are now extensive urban agglomerations whose populations are multiples of those of the administrative central cities. In some large cities, because of city-to-suburb migration, the population of the agglomeration keeps growing even though the population within the administrative municipal limits decreases. In the London region population increases notably in areas situated outside the Green Belt, whereas in the agglomeration within the Green Belt it has been decreasing for some time.

8. To a lesser extent this is also true of "over-bounded" cities within fixed limits. Here, the expansion of the inner agglomeration is associated with some displacement or absorption of a population living at hitherto rural densities. However, since the displaced or absorbed rural population (with its lower densities) is usually comparatively small, the underestimation of rates of urban growth in most such instances is only slight.

9. The estimation and projection of urban population trends as defined within unvaried territorial limits has the advantage that change occurs only as a result of births, deaths and migration, but not from the reclassification of previously "rural" areas. Numerous other statistics referring to such constant areas can often also be assembled. There is no break of continuity in the statistical time series. It is convenient in many studies to compare population and other statistics which are available for the same fixed area.

10. In a large country where local administrative boundaries are flexible and frequently adjusted, the trend in "urban" population (administratively defined) may closely parallel the trend in the population of physically urbanized terrain. It can be assumed, in such a country, that administrative changes are made approximately in proportion to the geographic expansion of densely built-up areas. It can also be assumed that territorial adjustments will be made continuously in the future, having similar effect. Differences between administered "urban" terrain and the areas under dense settlement, in such an instance, may remain unimportant or negligible. For certain studies, however, the fact that continuous area changes are also involved must be borne in mind.

11. A problem arises especially in the instance of a country where administrative adjustments are made only from time to time. For in this case the adjustments can be abrupt and discontinuous, and it is difficult to predict what other modifications of "urban" boundary will be made in the future, if any. Projections of administratively "urban" population can then be scarcely made except on the uncertain assumption that administrative limits will remain unchanged. In relation to such an assumption, the past trend of administratively "urban" population would also have to be re-estimated in accordance with the most recent boundaries.

ADMINISTRATIVE DEFINITION: SEATS OF DISTRICT GOVERNMENT

12. In a number of countries basic administrative units of one single type cover the entire territory. Each unit is governed from one city or town situated within it,

and the population of these cities or towns is considered as the "urban" population, the remainder being "rural".

13. In actual fact, the seats of regional (district, municipality, canton and so on) government are usually also the centres to which certain particular administrative measures apply, hence in at least that sense they have a different type of "local" government. This is typically the case in Latin American countries. The effects of such a definition can be similar to those already discussed in the previous subsection, except under certain limiting conditions. It can fairly be assumed that, in view of the degree of regional autonomy, the outer boundaries of the "urban" centres are usually adjusted to coincide approximately with those of the built-up urban terrain.

14. Whereas the delimitation of such urban centres may be flexible, that of the districts (of which they are the centres) is usually quite rigid. New "urban" centres will rarely appear because the establishment of new districts probably occurs rather seldom. This despite the fact that new compact settlements other than district centres can also emerge. A new mining town, for instance, may fail to make its appearance among administrative urban settlements. Some urban centres, furthermore, may grow so large that their physical limits encroach on the territory of neighbouring districts. Unless a territorial reorganization takes place, part of the growth of large cities will then fail to be reflected in the population trend of the "urban" centres of which one is assumed to lie within each of the districts.

DEFINITION BY SIZE OF ADMINISTRATIVE UNITS

15. In many countries most of the basic administrative units are quite small, and there is no formal distinction of those of an "urban" type, all local governments being similarly constituted (in communes, circumscriptions and so on). This situation is found especially in some rather densely populated European countries. Since the area units are mostly small, the presence of a sizable population in any one of them usually indicates the presence of an urban cluster. Only in exceptional circumstances would an entirely rural commune comprise a large population. Moreover, where administrative areas are generally small, it can often happen that two or several neighbouring units are merged into one, permitting an expanding city to continue being administered as one unit. Territorially large units may emerge in time representing in each instance an expanding major city. Annexation of neighbouring communes into a city usually occurs only after some time lag, surrounding urban terrain or "suburbs" still being administered in the interim as separate units; but these also, for the most part, would be of greater population size than the more strictly rural units. The size of individual cities may often not be sufficiently reflected, but the size of the combined "urban" population (including separate suburbs which are also "urban") can well be represented by the population sum of all those units in which some minimum population size is exceeded.

16. The minimum size of units to be recognized as "urban", however, differs greatly between countries, varying in extreme instances from as little as 100 inhabi-

tants to as much as 30,000. Often the limit is 2,000, 2,500 or 5,000. A uniform limit cannot be prescribed for all countries since typical qualitative features or residential densities in settlements of a given size may differ among the countries. A few European countries have adopted a definition by which units with 10,000 or more inhabitants are considered as "urban", those with 2,000-9,999 inhabitants as "semi-urban", and those with less than 2,000 as "rural".

17. The trend of "urban" population defined in this fashion may well parallel that of population in built-up, urbanized areas. Part of the "urban" population growth will result from the surpassing of the minimum "urban" population size by additional administrative units, as a result of which those units are reclassified. But the growth of individual big cities may be inadequately reflected so long as many suburbs continue being administered separately.

ECONOMIC DEFINITION, APPLIED TO ADMINISTRATIVE UNITS

18. In some countries, where basic administrative units are small and uniform, "urban" administrative units are defined as those in which at the most a small percentage—less than some stated maximum—of the economically active population (or active males) are engaged in agriculture. There are also some countries where units are defined as "urban" by combined criteria of size and type of economic activity.

19. Such a definition is of value particularly in those countries where some agricultural villages are apt to grow larger than some small towns in which urban features predominate (e.g. mining towns, small suburbs, local trading centres). In such countries, evidently, a definition based on an economic criterion has greater relevance than one based on population size only. Though it is recognized that non-agricultural activities exist in areas settled in a rural fashion, and that there can also be a small amount of agriculture among urban residents, the coincidence of a prevalence of agriculture with other features describing a rural environment usually remains considerable.

20. The effect of such a definition on population trends in "urban" places is similar to that where the definition merely involves a size limit. Administrative units are added to the "urban" category, in this case, when non-agricultural activities in them come to outnumber the agricultural ones to the extent implicit in the definition. It is difficult, however, to assess the past and future trend for "urban" areas so defined. Where it is a matter of size limit only, the population estimates themselves express whether an "urban" size has been or probably will be attained at given dates. It is not so easy to estimate and project trends in the agricultural and non-agricultural composition of the labour force in each individual locality.

GEOGRAPHIC DEFINITION: AGGLOMERATIONS

21. The internationally recommended definition of "localities" is that of population clusters within the

contours of dense settlement, irrespective of administrative delimitations. This concerns localities of every size and economic type. The "locality" may consist of a small grouping of rural houses (e.g. a hamlet as distinct from completely dispersed rural population) and, at the other extreme, of an urbanized region comprising several administrative cities, assuming that the urbanized areas have coalesced. Among localities so delimited one may select those above a certain size, or those having mostly non-agricultural activities, to define "urban" agglomerations. It is evident that agglomerations expand geographically whenever there is building activity at their periphery. Upon occasion, two or several neighbouring agglomerations merge into one.

22. In some countries the delimitation of agglomerations on the occasion of a census is made on the basis of detailed map work including, as in Sweden, the measurement of distance between individual houses to determine which of them should be considered as included in the same agglomeration. But simpler determinations can be made, for instance, by using as units the groups of contiguous census enumeration districts in which a minimal population density is exceeded. The boundaries of the agglomerations may then not be determined with geographic precision but nevertheless accurately enough for demographic studies. In the United States, "urbanized areas" are established at each census, adjacent to administrative cities of at least 50,000 inhabitants. In Japan, any group of contiguous census enumeration districts having more than a certain high population density and a combined population of at least 5,000 inhabitants are referred to as "densely inhabited districts". It is possible of course that both in Japan and in the United States densely urbanized areas smaller than entire census districts are not included, hence that the urbanized area is somewhat under-bounded. Other methods for an approximate delimitation of agglomerations have come into use elsewhere, such as the multicomunal agglomerations which have been defined in France.

23. Speaking somewhat schematically, one may say that a major agglomeration, or "urbanized area", ordinarily consists of a central city (i.e. an administrative urban unit) together with densely urbanized "tentacles" branching out alongside the major routes of travel, whether roads, rails or waterways. Such an urban "octopus" may with time absorb within it other urban centres, e.g. satellite towns, or it may come in contact with one or several neighbouring "octopuses" thus forming a conurbation. Between the extended "tentacles" there remain areas inhabited at lower densities which must still be regarded as rural. Geographic growth of the "octopus" occurs through a lengthening and thickening of the "tentacles" and lateral outgrowths, from them which, with time, form a tissue of lateral connexions. Actually, of course, particular geographic features, if not also deliberate action, for instance the construction of a circular road around the city, will prevent agglomerations from attaining precisely such a schematic shape.

24. The noteworthy fact remains that the growth of agglomerations is an accurate reflection of the areas inhabited under physical urban conditions, i.e. at urban

densities. The trends of growth include the transformation of previously "rural" into "urban" areas, hence they imply area reclassifications.

25. The analysis and projection of urban populations in terms of all agglomerations above some minimum size has certain drawbacks, however. On the occasion of each population census the areas have to be delimited afresh. It is not possible to follow their continuous expansion through intercensal or postcensal time periods. Nor is it possible, for areas whose limits differ from any administrative boundaries, and which vary continuously, to organize the collection of other statistics, such as those on births, deaths, school enrolment, retail trade, motor vehicle licenses, and so forth.

26. Since usually only major cities and towns are demarcated in a census as agglomerations, small towns, though they may have markedly urban features, remain omitted from this special "urban" category, unless they are already absorbed in a major agglomeration. The combined population of the selected major urbanized areas is generally less than the country's combined "urban" population under a definition which can include far more numerous smaller cities and towns.

GEOGRAPHIC DEFINITION: METROPOLITAN AREAS

27. As has already been noted, administrative definitions often remain confined to constant areas, reflecting only part of the urban growth, with consequent insufficiencies in the measurement of the urban phenomenon. The definition of geographic agglomerations reflects the expansion of urban environments quite realistically, but has the disadvantage that no statistics other than those determined at each census can be collected for them, since their contours change continuously. Mainly to circumvent the disadvantages inherent in both types of definition, another concept has been formulated, namely that of metropolitan areas.

28. The metropolitan areas are usually conceived in such wide limits that they include all, or virtually all, of each agglomeration "octopus" and, in addition, the non-urbanized areas lying in the interstices between its "tentacles". The boundaries are drawn in such a way that they coincide with the outer limits of a group of existing minor administrative areas which are unlikely to change. These boundaries can, for a period of time, be left unaltered, and various types of statistics for each such group of administrative units can also be continuously secured. Reclassification of areas from "non-metropolitan" to "metropolitan", under these conditions, need not occur for some time. Of course, the average population density of metropolitan areas within their wide limits, is much lower than that of the more strictly urbanized terrain.

29. The determination of administrative units to be included in a metropolitan area often involves some quite precise criteria, such as the frequencies in travel and communications to and from the central city, establishing a high degree of economic and social interdependence with the city. Some areas under rural forms of settle-

ment are included where proximity to the city presumably exerts a major influence on their types or methods of land use; hence it is not illogical to include them within the wider urban periphery. In a few instances, groups of contiguous metropolitan areas have been described as a "megalopolis".

30. Again, the determination of metropolitan areas is usually confined to major cities only (e.g. those whose centres have at least 50,000 or 100,000 inhabitants), leaving numerous separate towns which form no part of the metropolitan areas. On the other hand, partly because of actual internal economic interdependence and partly because of statistical convenience, metropolitan areas have often become official planning regions in programmes of regional development.

31. When compared with the corresponding agglomerations, the metropolitan areas can be considered as "over-bounded" urban entities. As has already been noted, in "over-bounded" cities rates of city growth are more adequately reflected than in "under-bounded" ones, owing to the comparative smallness of the rural population which becomes displaced or absorbed as a result of the urban expansion. The extensive delimitation makes it possible in many countries, where urban growth is not too rapid, to maintain a constant demarcation of metropolitan areas over extended periods of time. Eventually, however, a redefinition of metropolitan areas can become necessary because of continued geographic expansion of the corresponding agglomerations and a further widening of their spheres of influence. Where this happens, "geographic" methods of population projection may have to be adopted.

32. Because of the emerging new settlement patterns around the cities of industrialized countries, it will probably become increasingly useful to distinguish four types of areas, namely urbanized and non-urbanized areas within metropolitan regions, and urbanized and non-urbanized areas outside such regions. So far, few censuses permit the distinction of areas according to such a four-fold classification.

OTHER DEFINITIONS

33. In some countries urban areas have been defined as administrative units presenting certain "urban features". Among such features there might be the network of paved streets, numbered houses, streetlights, domestic electricity, sewerage, mail delivery, the presence of a secondary school, a church, a medical establishment, a police station and so forth. The use of qualitative data describing urbanism has much conceptual appeal since, according to the conditions in a country, those might indeed appear to be the most distinguishing features. On the other hand, in the context of trend study and projection, the "urban" significance of any such features cannot be considered as permanent. Whereas at one time electric light or police stations may be mostly confined to urban areas, eventually such features can also spread over the countryside. The significance of an "urban" definition expressed in terms of such descriptive attributes can change with the passing of time.

PURPOSES SERVED BY VARIOUS DEFINITIONS

34. The projections of "urban" and "rural" population may have to serve various planning and policy purposes, among which may be mentioned, very roughly: economic plans, social measures and physical plans.

35. For the geographic disaggregation of economic plans, recourse is made increasingly to regional planning, including those regions which comprise each of the major cities. Such purposes are usually best served where the estimates and projections are made in the rather extensive terms of "metropolitan" and "non-metropolitan" population, preferably within constant boundaries. Internal linkage by an interconnected system of transportation can usually be assumed in such urban regions. Geographic priorities in particular investments can be reasonably determined in such a regional context.

36. Social policies depend for their implementation on existing organs of local government as described by law.

For the formulation of social policies, therefore, it is preferable to define "urban" populations as those contained within "urban" administrative areas. Since the boundaries of these areas may or may not be flexible, as has been explained, the implications for a population projection can be various.

37. Physical plans, finally, are much concerned with environmental and traffic-flow management within areas inhabited at an "urban" density. In such contexts, it is probably most useful to project the population of agglomerations (or "urbanized areas") as distinct from other areas of lesser population size or density. But more than one purpose may have to be served by the same projections, and statistics on "urban" and "rural" population are not usually available in every convenient form. Depending on the nature of available statistics, there are usually inevitable constraints to the definitions which can practically be adopted for a population projection.