The Short Guide to

ZonPlan©

a winR+© tool to obtain and map indicators

ZonPlan and winR+ are software developed by CELADE in the context of a joint CELADE-University of Waterloo Project financed by the International Development Research Center (IDRC) of Canada with additional support to CELADE from the United Nations Fund for Population (UNFPA), the United Nations Regular Budget, the Canadian International Development Agency (CIDA) and the Inter-American Development Bank (IDB)

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ZonPlan is a software tool to obtain and map indicators. You can calculate the values of the indicators for any given geographic level, such as for city blocks, neighborhoods, districts, provinces, etc. The software takes advantage of the special processing capabilities of the Redatam for Windows software, winR+, which is bundled with the ZonPlan package. winR+ carries out the actual processing and manipulation of your database “behind the scenes” so that you, as a ZonPlan user, do not have to know anything about programming winR+ for the REtrieval of DATa for small Areas by Microcomputer (REDATAM).

The present Guide shows you how to utilize ZonPlan for the creation and display of simple indicators, taking advantage of the Windows operating system to select and process information through the use primarily of the mouse with windows, menus and lists.

The Guide is divided into six sections:

WHAT IS ZonPlan?

INSTALLING ZonPlan

OBTAINING INDICATORS

MAPPING THE RESULTS

CREATING MORE COMPLEX INDICATORS

DEFINING GENERIC VARIABLES
How to use this Guide

How you should use this Guide will depend on the prior knowledge you may have of ZonPlan, on the database that you will use, and on the task that you wish to execute, since the Guide is organized by the type of processes that the software can perform.

If you are a new user of ZonPlan, it is recommended that you read the whole Guide from the beginning, following the order of the sections which will take you systematically through all the ZonPlan operations.

To help you get started rapidly, a demonstration database is included with the software. It comes with certain definitions —see page 31 on generic variables— required to connect the user’s data with the previously programmed indicators. Thus with the demonstration database, you can proceed immediately to open an indicator from the principal Menu as discussed in Section 3.

On the other hand, if you already are familiar with ZonPlan and wish to apply it to your own database, you should read Section 6 to learn how to link the generic variables for your dictionary in your winR+ Workspace. Once you have linked the generic variables to your own dictionary, you can proceed to open an indicator and process it as indicated in Section 3.

In all cases, it is important to note that this short Guide is meant to "walk" a first time user through ZonPlan. It does not show you how to use all its features, such as creating a new column in a table and adding values to it, use of temporary storage for selections, hiding columns, linking two tables, etc., but once you understand the general logic of working with the ZonPlan windows, tables and maps, you should have little difficulty in exploiting the Main Menu Bar options not discussed in the Guide.
Obtaining further information

The indicators in ZonPlan are designed to be used without external assistance other than the on-line Help in the software and this short Guide. However, if you want to develop your own application of ZonPlan with specific indicators for your own project(s) and database, then you may need external assistance since this requires the pre-programming in Microsoft Visual Basic® of the new indicators that you want. For further information and assistance to meet your specific needs, communicate with the Latin American Demographic Centre (CELADE) via:

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The CELADE page of the World Wide Web on the Internet contains information on ZonPlan, winR+ and other Redatam-related software, on how to order software, and on how registered users can obtain software updates. Look for ZonPlan and the other Redatam-related materials in Spanish and English at the following equivalent addresses:

www.ECLAC.ORG/CELADE-Esp
www.CEPAL.ORG/CELADE-Esp

ZonPlan and winR+ were developed within the joint R+GIS Project of CELADE and the University of Waterloo, Ontario, Canada, funded by the International Development Research Centre (IDRC) of Canada. Descriptions of the R+GIS spatial decision support tools created by the University of Waterloo, namely, AccessPlan for health care clinic accessibility location and resource allocation, EduPlan for school location planning and management, and TourPlan for site selection and multi-criteria evaluation of tourism development, can be found along with ordering information at:

www.fes.uwaterloo.ca/Tools/index.html
You can communicate with Professor Brent Hall, who was the Principal Investigator of the R+GIS Project in Waterloo, via:

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ZonPlan is a program developed by CELADE within the third generation of Redatam-related software packages as part of the joint R+GIS Population-Related Tools to Facilitate Decentralized Local Development Project of CELADE and the University of Waterloo, Canada. The joint Project was funded by the International Development Research Centre (IDRC) of Canada and the work in CELADE was also supported by the United Nations Fund for Population (UNFPA), the Inter-American Development Bank (IDB), the United Nations Regular Budget and the Canadian International Development Agency (CIDA).

Within the above mentioned Project, winR+ and the decision support tool ZonPlan were created in CELADE, and three other decision support tools in the fields of health, education and tourism were created at the University of Waterloo under the leadership of Prof. Brent Hall. The two institutions coordinated their work and the field testing in Latin American and Caribbean countries.

In CELADE, Alejandra Silva, a consultant in Geographical Information Systems (GIS) developed the basic outline for ZonPlan and then she and Serge Poulard, a programmer analyst who also wrote winR+, designed the system to carry out the functions proposed. Using Microsoft Visual Basic®, Alejandra wrote many of the user interfaces for the ZonPlan indicators and Serge wrote the internals of the system and the link to winR+.

A Beta version of ZonPlan was tested by Alejandra Silva in the canton [municipality] of Escazú in Costa Rica, with much cooperation from the successive Municipal Directors of the Canton, Armando Botazzi and Jose
Miguel Gonzalez and their staffs, of whom the most directly involved was Carlomagno Gomez.

_ZonPlan_ was also tested in Chile in a project of the University of Chile for the National Institute of Youth [Instituto Nacional de Juventud (INJ)]. This resulted in creation of _INJuMap_, an application of _ZonPlan_. This variation of the _ZonPlan_ idea was developed by Alejandra Silva, with Laura Ortiz, and Serge Poulard, who did the programming.

The work on _ZonPlan_ was begun when Arthur Conning was the Principal Investigator of the above-mentioned Project and the Chief of the Latin American Population Information Area of CELADE, and, when he retired, was extended and completed by Dirk Jaspers Faijer, Coordinator of the CELADE Training and Special Programmes Area and Acting Chief of the Latin American Population Information Area of CELADE.

Alejandra Silva wrote this _ZonPlan_ Guide in Spanish and Arthur Conning did the translation into English.
Section 1.

WHAT IS ZonPlan?

ZonPlan is a tool which facilitates the spatial identification of specific areas with selected characteristics—target populations—through the use of socio-demographic indicators obtained from information from various sources, the most important of which is usually the population and housing census of a country. Through the use of the ZonPlan graphical interface, the software simplifies the creation of the indicators and their display on maps in order to helps localize populations with specified characteristics. For instance, the problem facing a municipal planner might be to determine where the greatest concentration of the elderly live within a municipality; or how to calculate the proportion of houses, within each block of a neighborhood, with deficient infrastructure; or how to ascertain the number of female-headed households within each neighborhood of the municipality.

In each situation, the planner or analyst has an overall area of interest—called here the Selection Area or Selection Set— for example, he/she needs indicators for all the blocks of a municipality. ZonPlan facilitates the calculation of the indicators for each of the many block sub-areas within the municipality Selection Set and the subsequent mapping of the results, block by block.

The software may be seen as a type of decision support tool for planning and policy making in various sectors concerned with economic and social development, such as health, education, infrastructure, etc. Workers in these sectors and many others require the use of population information
and its spatial distribution, often in association with information from other fields as well. ZonPlan is a tool conceived for these planners—in public agencies as well as in non-governmental organizations and the private sector—which do not have time to get involved with elaborate statistical processes, and who need to characterize and spatially locate specific populations based on a socio-economic profile.

The tool is designed for working with numerical population and related data in the public domain, in conjunction with digital cartography that can be manipulated by computer. The data, which may come from national censuses, surveys, administrative statistics, etc., is stored in the winR+ format which can also be connected to external databases. The ZonPlan program acts as the user-interface with winR+, which takes care of the statistical processing. The software can be used in different languages—at present, you can change between Spanish and English, and soon French and Portuguese will be added. The potentialities of the software go far beyond this Guide, since the software can be accommodated to the specific needs of a user.

Information (data & maps) for ZonPlan

As data for small areas is normally required by users of ZonPlan, the population and housing census is the major source of data, since it is usually the only source that covers and identifies areas of a country often down to city blocks. This data is accessed through the winR+ program, which is specially designed to locate census and other data for specific small areas efficiently in very large data files—censuses usually have millions of records corresponding to persons and houses and many variables for each—and to process the information very rapidly.

Since ZonPlan accesses existing winR+ databases, information for using the database is available in the previously defined winR+ dictionary. The database in winR+ can be enriched with other sources of information, be they surveys, other censuses or data from external files that are linked to the winR+ but not physically part of the winR+ database.

Once an indicator has been processed, the result is displayed as a table, which has rows that represent the (sub)areas and a column for the values of the indicator, that is, the value on the indicator is expressed for each
area at a given geographical entity level—for example, for each block of
a community, or each municipality of a region or country, and so forth—.
Once these values have been obtained in the table, they can be displayed
on a digital map corresponding to the geographical level of the table.
Although the table shows specific values for each area, it is very difficult
in a table to see how the values change spatially from area to area. Thus,
even a simple display of the values on a map, as done automatically in
ZonPlan, allows a user to better visualize spatial patterns on the
indicators of interest.

The first version of ZonPlan, version 1.0, works with digital maps obtained
from Atlas GIS® and MapInfo®. both widely used Geographical
Information Systems (GIS). These maps in the format .bna, can be
obtained directly from Atlas GIS, itself, or through conversion to Atlas
GIS format in ARC/INFO® of maps created in the latter system. Maps
from MapInfo export format .mid/.mif are obtained directly from
MapInfo. As a prerequisite for linking the data used with ZonPlan and
winR+ to each area on the map, the digital map(s) must have a code for
each area that is associated with the codes for the same areas in the data.

The demonstration database that accompanies ZonPlan

To facilitate learning to use ZonPlan, a demonstration winR+ census data
base is included with the software for the hypothetical country of New
Miranda. The data for New Miranda include a digitized map—normally
called a cover in the digital cartography field—for the geographical level
that corresponds to districts. The file is:

nmir.bna    The areas—polygons—are census districts. The cover is
            for the entire country of New Miranda; that is, all the
districts of the country are included and each district is
coded with the census code that links it to the population
and housing census data for districts.
Section 2.

INSTALLING ZonPlan

Before beginning the installation of ZonPlan, please check whether the equipment, operating system, etc., that you intend to use is adequate for your purposes and that you have sufficient hard disk space to accommodate the software and your likely database(s).

What are the computer requirements?

**Recommended configuration**

When your database is small or your want to process indicators for areas within a small overall area, the *Selection Area or Selection Set*, your computer does not have to be very powerful — see the minimum configuration, below. However, if you are likely to process a large amount of data, that may involve millions of records, such as when an indicator is required for each block of a large municipality or city along with its cartographic display, it is desirable to have a more powerful computer. The following is a reasonable hardware and software configuration for such use:

- A PC IBM compatible microcomputer with a 133MHz Pentium-based system CPU or higher.
- Windows 95; or Windows 3.x, running 386 Enhanced Mode, with DOS 6.0 or higher.
- 16 MB RAM or higher.
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- A mouse or pointing device.
- Color monitor SVGA, Windows compatible.
- A hard disk with at least 13MB of free space for the software plus the space required for your data.
- 3.5 inch high-density floppy drive to install the software, make backups, etc.
- (Optional) Color printer.

Minimum configuration

- An IBM fully compatible microcomputer with a 486 CPU with a math coprocessor.
- Windows 3.x, running 386 Enhanced Mode, with DOS 5.0 or higher.
- 8 MB RAM.
- A mouse or pointing device.
- Monitor, Windows compatible.
- A hard disk with at least 13MB of free space for the software plus the space required for your data.
- 3.5 inch high-density floppy drive to read in the software, make backups of user programs, etc.

Installing ZonPlan

As the ZonPlan program comes together with the winR+ program, the installation of both are carried out together. Before beginning the installation, you should read the README file that is normally on the first diskette. Then continue with the installation:

1. It is recommended that you close all the programs that are open under Windows.

2. Insert Disk 1 of the software in the disk drive.

3. In Windows 3.1, select Run after clicking on File on the Main Menu Bar of Program Manager. Type a:\setup where a: is the directory of the floppy drive that you are using.

The SHARE program should be activated before starting Windows 3.x. Usually it is activated from your autoexec.bat file, but if not, you must enter the following command before starting Windows,
or, to avoid doing this in each session, place it in your
autoexec.bat file and restart your computer:

SHARE /L:500 /F:5100

4. In Windows 95, select Run from the Start button at the bottom left
of your screen. Place Disk 1 of the software in the disk drive and
click on the OK button.

By default, the programs winrplus.exe and zonplan.exe are
installed in the winrplus and zonplan directories or folders,
respectively, unless you indicate otherwise.

5. Demonstration database and associated Workspace: Follow the
instructions in the README.txt file. By default the following two
directories will be created and the indicated files placed in them:

   c:\winrplus\work    wnmirEng.mdb    [Workspace]
                      nmir.bna        [map]
   c:\winrplus\datwnmir .bin, .ptr files  [New Miranda
database]

Once you have completed the installation, you can start ZonPlan by
clicking on its icon from the winR+ Program Group.

In Windows 3.x, the icon should appear within a group and in
Windows 95, it should appear under Programs on the menus that comes
up when you click on the Start button. If it is not, you can add the
program to the StartUp bar, editing its parameters or create a shortcut to
ZonPlan in the main screen. In Windows 3.x, you can add the icon to any
group that you desire by simply dragging the file zonplan.exe to where
you want it.
The main screen of **ZonPlan**

*ZonPlan* is an application which acts as an interface for *winR*+. Hence, when the former starts, the main screen (see Figure 1 on page 10) is very similar to that of *winR*+, whose design follows the conventions of the Graphical User Interface (GUI), and, like most other Windows programs, operates on the basis of options and commands called up from menus, icons and windows.

**Obtaining Help in ZonPlan**

*ZonPlan* provides on-line *Help* for all its windows. *Help* may be accessed from the Help Icon or from *Help* on the Main Menu Bar. Under the latter, options are presented for getting general or specific Help depending on the indicator or process which you are carrying out.

The *ZonPlan About* option on the *Help* menu tells you the version of *ZonPlan* that you are using and lists the donors which made the software possible.
Section 3.

OBTAINING INDICATORS

This section outlines the procedure for calculating the indicators that have been preprogrammed in ZonPlan. For reasons of space, one indicator, Population Structure, is taken as an example. The other indicators each have different parameters, but the since the style of working is always the same, you should have no difficulty working with them.

The ZonPlan Workspace

For a ZonPlan session, it is necessary to start ZonPlan by clicking on its icon and then open a winR+ Workspace—which is a file name.mdb—either for the demonstration New Miranda database or the Workspace previously created in winR+ for your own data. Then in ZonPlan, click on File on the Main Menu Bar, and then on Open Workspace (abbreviated as File/Open Workspace). In the window that opens, select the .mdb file that you want. In the case of the demonstration database in English, the Workspace is wnmieng.mdb in the c:\winplus\work directory or folder, if that is where you put it.
Figure 1 shows the Workspace window that appears. It is similar to a winR+ Workspace, but with the difference in ZonPlan, that it shows only indicators. This very much simplifies your work, but it does not allow you to access directly the winR+ programs that are used on your behalf, Selection Areas, map definitions or the lists of areas —called AREALISTS in winR+—, all of which are stored in the winR+ Workspace.

As seen in Figure 1, the main screen of ZonPlan, has the usual Main Menu Bar at the top with items for working with Files, the Database, Windows and Help; in addition there is the Workspace window for managing indicators.

You can open a new indicator by clicking on the New button in the Workspace window and also can open an existing indicator from among those that appear on the list using the Open button. Furthermore, you can eliminate an indicator on the list by highlighting it with a click in its the left-most column and then clicking Delete. These same options for managing indicators are available on File of the Main Menu Bar.
Calculating a new indicator

To calculate a new indicator from among those available in ZonPlan, click on the New button of the Workspace window, or click on File|Open on the Main Menu Bar. Another window will open, in the upper part of which are listed the seven principal categories of indicators: Demographic, Education, ..., Specific — see Figure 2 —. As each category is clicked, its list of predefined indicators appears in the middle section of the window.

To select an indicator, click on its category, and then on the indicator name so that it appears in bold print and finally click OK. By default, the new indicator has a unique name formed by the letters IND and a number which increases consecutively as you open new indicators. Therefore, the first indicator has the name IND1. The user can explicitly change it when saving the indicator by using File|Save As on the Main Menu.

Each indicator has parameters which can be modified before processing; for this reason, the same indicator — e.g., an indicator of economic activity — can appear various times in the Workspace, in each of which there are differences in the definition of the indicator and, of course, the name.

Groups of indicators

The indicators in ZonPlan are organized into seven general groups as seen in Figure 2. Demographic, Economic, Education, Health, Dwelling conditions, Custom defined by the user, and Specific. The predefined indicators in ZonPlan are included within each of these general groups. As seen in Figure 2, within the general group Demographic, there are two indicators: Sex ratio and Population structure. To access a indicator, you select its name with a mouse click and then press OK.
The present version of ZonPlan has the following indicators defined:

- **Demographic**
  - Sex ratio
  - Population structure
- **Economic**
  - Economic activity
  - Dependency ratio
- **Education**
  - Education assessment
  - Household educational level
- **Health**
  - Women in the fertile ages
- **Dwelling conditions**
  - Household conditions
- **Custom** (defined by the user)
  - Simple count
  - Compound binary indicator
- **Specific**
  - Vulnerability of household
  - Social structure of Household
These indicators, all of which apply to a given geographical area, can be defined briefly as follows:

**Dependency ratio**
Ratio of dependent persons to the persons in the economically active ages.

**Economic Activity**
Various indexes which measure the employment and unemployment, for example, the population economically active (PEA), the percentage of unemployed, and the number of dependent persons.

**Sex ratio**
The ratio of the number of men to the number of women.

**Population structure**
The pyramid by age and sex.

**Household conditions**
The number or the proportion (%) of houses in a given area which lack basic services infrastructure (e.g., water, electricity, etc.) and/or present problems with respect to the quality of the housing.

**Women in the fertile ages**
The number or proportion (%) of women in the fertile ages, normally between 15 and 49 years. The user can define the age range.

**Education assessment**
A group of indicators which measure the educational level of the population according to variables available in the database: highest course attained, type of regular education and literacy.

**Household head educational level**
The number or proportion (%) of household heads which have completed a given educational level.

**Simple Count**
This indicator permits the user to count persons, houses or other entities given a user-defined condition.

**Compound Binary Indicator (CBI)**
You can define your own indicator by combining diverse variables for the same geographical area to arrive at the final indicator.
Specific: Vulnerability of the household and Social structure of the household.

These indicators use an expanded database to which new variables have been added by the user. If your database does not contain these variables or similar ones, these indicators cannot be activated.

Processing

The specific parameters and variables are defined for a given indicator in a window; they are then passed to winR+ for the actual processing. Among these parameters are the basic or indispensable one which must be defined for any of the indicators: the name, the overall area to be processed (Selection Set) and the geographical level — also called the entity level — for which the indicator is to be calculated. In addition, there are the specific parameters and variables required for the actual indicator being calculated, and if relevant, a filter such as an age range or a particular sex.

Figure 3 shows the window for calculating an indicator of Population Structure; in the upper part of the window there is combo box, which, when you click on the arrow opens a list of the Selection Sets (overall areas) that are available — they were previously defined in winR+ and stored in its Workspace —. You must select one of these. In the Figure, ALL was selected in order to process all the database. There is also a

![Figure 3. Population structure. This indicator determines the population by age group and sex for each geographical area.](indtpobi.wpg)
large white box to write a description about the indicator and how it was defined.

Different parameters, depending on the type of indicator, are presented for you to define, e.g., variables, categories of variables, age range, sex, etc. For the indicator in Figure 3, you can determine a specific age range and a specific sex. In the lower part of the window, you define the geographic level for which the indicator will be calculated, in this case, district; the combo box lists the options that are available in the database. Since Percentage is selected, the resulting indicator will be a percentage. After selecting the parameters, you can review the statistical program that has been automatically generated for the process in winR+ by clicking Command. To carry out the actual processing, click on the Run button. If you want to save the indicator with it parameters, click on Save.

After the indicator is processed, a window opens with a table listing the areas for the chosen Selection Set. In Figure 4, values of the Population structure indicator are given in the right column, one for each district, the codes for which are in the left.

Viewing and reviewing the results

Attribute table

Attributes are all the processed variables in a table which are associated with a given geographic entity level within a hierarchy such as that of a census—e.g., country, county, district, area, block, etc., from highest down in the case of New Miranda—. Each indicator is an attribute at the level at which it was processed. The table of attributes—called an AREALIST in winR+— seen in Figure 4 shows each geographical area as a record and the the census code as an attribute, as well as the name of the area if it has one, and the resulting indicator that you have calculated. In this case the indicator has the name Indic by default. Note that the term “attribute” is used here since you will move the information into the geographer’s world of maps; geographers use “attributes”, while other professionals use “fields” or “variables”.

You can carry out the same operations on this table of attributes as on a table in winR+, for example, you can select records, sort the records from highest to lowest on a given attribute or vice versa, edit them, add new
attributes, join with other tables, save the table, export it, and last, but not least, display the values of an attribute on a map.

![Figure 4. Table of results for the Percentage of youth in each district indicator.](table1i.wpg)

**Selecting areas by attribute**

As seen in Figure 5, you can select records in a table according to a logical condition by clicking on Record|Select by Query on the Main Menu Bar when the AREALIST window is active. Alternatively, you can select records one by one manually by positioning the cursor in the left most column of the table and then clicking so that the record turns to another color—dark blue—.

Within the Query, depending on the table and indicator, you can formulate any question in logical form, e.g., districts with more than 200 persons, counties with an index of unemployment less than 5%, districts with a % of youth higher than the average, etc. The Expression Builder seen in Figure 5 is designed to facilitate writing logical expressions.

Your selection can be manipulated in many different ways according to the options that appear after clicking Record on the Main Menu Bar. The records selected can be grouped, deselected to start again, or all the
records can be selected. You also can send the selected records to a
temporary set for later use. It also is possible to save your records as a
Selection Set to define an overall area for processing using File|Create
Selection Set. Then the Selection Set can then be used by ZonPlan to
process an indicator.

Figure 5. Selection by Query using an Expression Builder (right). All areas are
selected which have a percentage of youths higher than the median(table2i.wpg)
Section 4.

MAPPING THE RESULTS

While there are many instances in which you may simply want the values that appear on the output table, ZonPlan was designed to facilitate the transfer of information to a map, including the grouping of values and the assignment of colors to the groups.

Classifying and displaying the results on a map

To pass the values of an indicator to a map, the AREALIST window must be active and one or more records selected. In the table you choose the attribute —only numerical— with a click on the column name, which then should appear in the box at the upper right. Then click on Columns|Link to map on the Main Menu Bar. The Classification and Mapping window opens as shown in Figure 6.

This is the window designed to assist you to classify a numerical attribute and to transfer the result to a map as colors. It usually is difficult to understand a map that has a different color for each distinct value of an indicator such as Population structure seen in Figure 6. Classification "classifies" the values into groups according to the rule and the number that you set. Then a color is assigned to each group.

The Classification and Mapping window provides a series of pages, each of which can be assessed by clicking the tab of the page. These pages —with Tabs titled General, Classify, Map, Legend and Fonts— provide
you with step by step assistance in the classification procedure and subsequent mapping. The function of each of these is described in the following paragraphs.

Selecting the attribute to be mapped

After clicking on the General Tab, the first step is to select the attribute which you want to classify and map. Clicking on the arrow of the Select data field combo box at the upper right, you can select the indicator of interest; in fact, ZonPlan makes this selection for you if you first chose the attribute in the AREALIST window. The values of the indicator are also shown along with the area codes and there is box giving basic statistics for the indicator.

![Classification and Mapping window, showing the General Tab](classif1.wpg)
Type of classification

The second step, carried out after clicking on the Classify Tab, is to classify the variable into a given number of classes and to assign colors to the first and last class so that ZonPlan can graduate the in between colors for the rest of the classes.

Since there are various methods for grouping the values of an indicator, the Classification type must be selected before classifying the variable. ZonPlan provides four methods: 1) Quantiles, in which each class has the same number of records; 2) Equal intervals, in which the range of each class is the same without concern for the number of cases that fall in each class; 3) Single values, where each distinct value of the indicator is a class — the number of classes is equal to the number of distinct values —; and 4) Manual, where the user determines the range of each class.

![Classification and mapping](image)

Figure 7. The Classification and Mapping window showing the Classify page.

Before carrying out the classification by clicking on the Classify button, you must define the number of classes using the Classes combo box.
—you click on one of the values given or write-in a number—. In Figure 7, the Quantile method will be used to define 3 classes.

The map legend

Once the classification is done, the results are shown in a matrix (see Figure 7), which gives the minimum and maximum value of each class and the number of records that fall into each of these ranges. The last column remains blank to allow you to write a legend describing each class. To do this, you have to place the cursor in the first cell of the blank column. ZonPlan helps you write the legend through the three buttons at the bottom of the matrix: Classes gives the number assigned to each class, Ranges gives the minimum and maximum value defining each class; Counts gives the number of records in each class; and Clear to erase the legend text completely.

Choosing colors for the map

Finally in this same window, you must choose the colors which will represent each category on the map. Since you often want to show visually which areas have more of the attribute and which less, with graduations in between, ZonPlan requires that you give your color preferences for the starting class and for the ending class, and then the software graduates the color transition, assigning the intermediate colors to the intermediate classes. Double click in the Start color box to open up a palette showing various colors. Double click a color to select it. Repeat this operation for the End color box.

Displaying the map

Click on the Map Tab to carry out the third step (see Figure 8), which opens and contains the information that is needed to display the map which will receive the colors that you have chosen for the indicator. First, indicate the map to be used in the Map box. After filling the optional information for the text on the map, click the Display button to bring up the map. The maps that are available must have been defined previously in wink+.

Note that each of the optional texts can be written and then, when necessary, included or excluded from the display by putting a check mark or leaving blank the small boxes over each text.
Up to this point the map has been displayed, but the indicator is not shown. To send this information to the map, it is necessary to advance to the next page **Legend** and then to click on the **Apply** button. Each area on the map — usually called *polygons* by geographers — then is colored according the classes that you defined for the indicator (see **Figure 9** on page 25).

![Classification and mapping](image)

**Figure 8.** The Map page of the Classification window. (classif2i.wpg)

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**Changing Legend parameters and the text Fonts**

On the page with the **Legend** Tab, are other parameters which affect how the map is displayed, such as the **Legend [title]** box where you can provide a title for the legend, the option to show the areas on the map which do not have sufficient data to calculate the indicator, i.e., *missing*, and *not applicable* when the indicator does not apply to the certain areas. You also can modify the colors on the map: **Default**, which is the color,
normally white, when the map is opened; **Selected**, which is the color of an area when it is selected, normally yellow; **Not Applicable** and **Missing Values**, which define the colors for these situations. To change any of these colors, double click the color box and then double click on the color of your choice in the palette that appears. Of course, none of these colors should overlap with the colors used to classify the indicator.

*ZonPlan* comes with a pre-defined font to be used for the title and other text on the map display. However, if you want to make changes, click on the **Font** Tab. On the page that appears, you can change the font by clicking on the Set Map Font button which brings up the usual Windows font selector windows. You can also set the relative sizes of the different text with respect to the title; e.g., to make the legend text around one half that of the title, use 5 or 6 in the **Legend Items** box.

If you change any values on the **Legend** or **Fonts** pages, click on the **Apply** button of the respective page to transfer the changes to the map window.

### Changing the layout of your map

At any time that the map is displayed, you can change the positions of any of the components of your map display, e.g., the map, title, etc., by clicking with the right button over the object of interest so that the cursor changes to crossed arrows and then dragging the object to where you wish.

### Identifying and selecting areas on the map

#### Individual identification

On the map, you can request the identity and information for any area —polygon—by clicking. With the map window active, click on **View|Query Mode** on the Main Menu or simply press the Ctrl and Q keys at the same time. Now when you return to the map window, the cursor is an arrow with a question mark and when you click on any area, an *Info* window appears which has information, if available in the database for the area, including the mandatory unique identifying code and an optional name of the area, plus all the attributes that you have in
the table that you linked to the map—in the example carried out here, only Ind1 exists, but the table could have more attributes—.

Selection of individual areas

On the map you can select any areas of interest. First, with the map the active window, click on View/Select Mode on the Main Menu Bar. Then click on any area on the map which selects—highlights—the area and also highlights, the corresponding record in your table, if it is open (see Figure 9). You also can start by clicking in the left-most column of a record in the table to see it highlighted on the map. You can do this for any number of records. You can also deselect any of the selected records by clicking either on the highlighted area shown on the map or by clicking in the first column of the corresponding highlighted record.

Figure 9. The map with the results of the indicator shown. In Select Mode, you also can select/deselect individual areas which are reflected in the table and vice versa.
Section 5.

CREATING MORE COMPLEX INDICATORS

In addition to the pre-defined indicators in ZonPlan, there are two indicators within the Custom group (see Figure 2). These indicators—Simple Count and Compound Binary Indicator—are more generalized than the others and allow you to define your own count-based and binary sums indicators using any variables in your database.

Simple counting

Simple Count allows you to count the number of cases at a given entity level in the database hierarchy that are in a given higher level entity. For example, you might want to count the number of persons within each county or to count the number of houses within each district. Furthermore, you can filter or condition which cases you want to count, for example, only the women who are heads of household, or only houses which do not have water. Figure 9 shows the window of Simple Count, where ZonPlan is requested to count the number of houses without water.
Since it is necessary to count, not houses in general, but only those without water, as seen in the Figure, you must place the following expression within the **Condition** box, such that only when the expression is *True*, will a house be counted: `90housin.90water = 1`. If you click on the **Condition** button, the *Expression Builder* window come up to assist you —see the text associated with **Figure 5** on page 17 for more about the Expression Builder—. If you wanted to count women household heads in each district, you would use a condition or *filter* expression with two variables: `90sex=2 AND 90relat=1`, where `90relat` is the variable for relationship to the household head and 1=household head. In all counts, you can request a number or a percentage of the total count without a filter for each given area involved.

Note that the expression can involve any number of variables, but they all must apply to the entity being counted; that is, if you are counting persons, you can combine only variables at the level of person.
Compound Binary Indicator

The objective of the Compound Binary Indicator (CBI) is to offer greater flexibility in the creation of indicators. This indicator is defined entirely by the user and permits the combination of various variables for the same entity level. For example, you can calculate the number or percentage of households in each district without water, a refrigerator or a radio.

![Dichotomous Compound Indicator](image)

**Figure 11.** Compound Binary Indicator window to determine the percentage of houses in each district which are lacking all three of water, a refrigerator and a radio.

The combination of variables is based on the recoding of each into a binary variable with only two values, 0 and 1. As each case is processed, *ZonPlan* determines if it *True* for each recoded variable, then adds up how many are *True*, and finally determines if the case meets the minimum score to be included in the count. Using the window shown in Figure 11, the counted entity is placed in the Select entity box, and the
**Output level** is indicated. In the **All variables** combo box each the variable is selected and for each of them, the values are chosen such that the **True** condition is in the first of the two boxes at the bottom right. Clicking on a value sends it the other box. **ZonPlan** indicates the **Maximum score** at the bottom right and the user indicates the **Minimum score to be included**.
Section 6.

DEFINING GENERIC VARIABLES

ZonPlan uses the variables in the winR+ database to calculate each of the predefined indicators. Since the program created by ZonPlan to carry out the calculations in winR+ for a given indicator must be generalized to allow working with different databases with different names of variables, etc., the actual variables in the database are "mapped" to generic variables; these are then automatically assembled into a calculation program based on the parameters provided by the user. ZonPlan stores the information on the generic variables in the Workspace.
Linking generic variables to database variables

Given the methodology used by ZonPlan, when a new database is setup—or a new Workspace for an existing database, it is necessary to connect the generic variables one by one to the corresponding variables in the dataset. Although relatively easy, normally this would be done by a person familiar with winR+ knowledgeable about the database content.

Supposing that you wish to work with a new database, you first create a Workspace in winR+ for the new database. Second, after starting ZonPlan, if it is not already open, you click File|Open and select the newly created Workspace; you may first have to click File|Close to remove the existing Workspace. Third, click Database|Edit Generic variables on the Main Menu Bar to open a window with four buttons, General, Persons, ... that brings up the corresponding windows. After filling in the entity names in the General window which first opens, click on the Persons button to bring up the window shown on the left in Figure 12.

![Figure 12](GenVar2i.wpg)

After clicking on the Dictionary button to bring up the window shown on the right of the Figure, the name of each variable is entered into the blank
boxes in the right window. For instance, if the blank box is for
**Individual age variable name**, the corresponding database variable
90age is deposited in the box by holding the *right* mouse button on the
90age variable in the Dictionary and dragging it to the box—as always,
the variable name is written: `entityName.variable Name`.

Some variables also require the definition of certain categories of the
variable; these are written in after consulting the information on the
variable in the Dictionary window—click on the variable to highlight
and then double click to open up the window with the categories of the
variable—. In this way, all the variables, categories and entities are
defined for use in *ZonPlan*. If the variable does not exist in the *winR*
Dictionary, the box must be left blank.

In some cases, a list of variables is requested, e.g., the [economic]
*Activity list* box. In such a case, more than one variable may be entered
into the box with a comma between each.

Once these generic variables are defined, the *Save* button is clicked to
enter them into *ZonPlan*. Note that you can access and edit these
definitions at any time during a *ZonPlan* session.

**Other variables from the *winR* data dictionary**

A *winR* database is described by its dictionary, that is, there is a
description of each variable, its codes and its geographic entity level. The
main dictionary can be opened at any time in *ZonPlan* to examine the
variables and their categories as well as to see the hierarchical structure
of the entities.

In addition to the generic variables, it is necessary to provide *ZonPlan*
with a list of all numerically-coded variables in your database, since the
general indicators, *Simple Count* and the *Compound Binary Indicator*,
can use any numerical variables at a given entity level defined in the
*winR* dictionary. Since this link is done automatically in *ZonPlan*, you
do not define generic variables for the all variables.

After completing this last step, you are now ready to create new
indicators in *ZonPlan* with your database. You just have to click the *New*
button in the Workspace and proceed as described in this Guide.
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