

# Continuous Employment Survey (ECE)

## Methods and Procedures

San José, Costa Rica  
AUGUST 2012



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# Executive Summary

On 31 May 2010 the National Institute of Statistics and Censuses started the implementation of a new program of household surveys, -The Continuous Employment Survey (ECE, in Spanish), specializing in the measurement of employment, unemployment and job income, which allows quarterly indicators of these variables.

Since 1987, this measurement of employment has been researched once a year, by means of the household survey of multiple purposes that takes place in the month of July<sup>1</sup>. Although this information has been very important for the analysis of the national reality, it does not reflect the employment situation at other times of the year.

In order to improve the quarterly estimation of main macroeconomic indicators, the Central Bank of Costa Rica also financially supported the formulation and establishment of this new survey program.

ECE is a statistical research that collects timely information on households in the country to know the evolution of main indicators of the labor market in the short term and to capture this way, the seasonal variations of the of the

population participation in the labor market such as: occupied, unoccupied and inactive.

The Continuous Employment Survey uses a probabilistic, two-stage and stratified sample, and therefore selected households constitute a representative sample of all households in the country. The sample changes twenty-five percent each quarter, which means that a dwelling may be interviewed up to four times in a year.

The sample consists of 752 segments, within which 12 homes are selected to each one for a total of 9024 properties per quarter. Between 57 and 58 segments have to be developed and distributed throughout the country (approximately 700 households per week); and, according to the sample design, the information can generate national disaggregated estimates by urban and rural areas.

The country was divided into nine geographical areas for data collection. The choice of these fieldwork areas is due to the sample distribution, the ease at developing fieldwork, minimizing costs, and be able to recruit local staff, which facilitates its right location and mobilization.

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<sup>1</sup> From July 2010, this measurement is performed with the National Household Survey (ENAHU, in Spanish).



Each of these areas has a supervisor, interviewers and a driver, whose personnel number varies according to the workload of the sector.

Data collection is carried out by using mobile devices. Paper form or phone capture is occasionally used for special occasions.

The survey considers a continuous process of improvement on the basis of the assessments, permanent work of the supervising team and the validation and consistency of data processes. Parallel to the fieldwork, variable encoding of the institutional sector, branch of activity and occupation is being done; In addition, a revision and validation of the interviews is carried out in order to detect any errors of omission, duplication, and data inconsistency and to proceed to their respective correction. The final revision of information considers activities such as quality controls of previous processes, critical analysis, review of information consistency and special cases.

Finally, a database per calendar quarter with information relating to employment and unemployment is made available. From that basis, data charts and graphs are prepared, thus fulfilling the ultimate goal, which is to count on regular data about the labor market.



# Introduction and objectives

The Continuous Employment Survey is a statistical research that collects information about population in relation to their labor force participation. Data obtained will help enrich INEC's official statistics, allowing information on seasonal variations in the labor market.

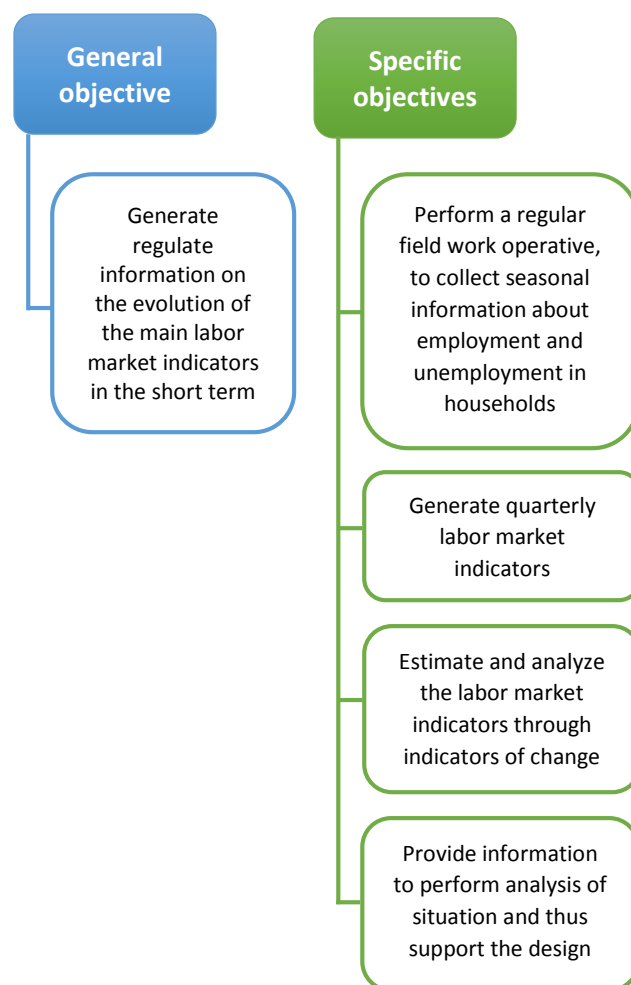
The latest international recommendations set forth in meetings of employment experts around the world conducted by the International Labor Organization (OIT, in Spanish) are used to the methodological development and the flow of the survey questions. This ensures criteria of national and international uniformity in data collection. The topics are broad and include the condition of activity, underemployment, income and informal sector measurement. These recommendations are complemented by a Manual system of National Accounts 1993, published by the United Nations.

The present report documents the methods and procedures used in the Continuous Employment Survey; it describes the variables, definitions and concepts used, in order to facilitate the user the interpretation and result analysis of established processes.

The first part of this document includes the characteristics, background and justification of the Project; the second

incorporates the conceptual framework; the third refers to the Survey structure describing the established processes; the fourth consists on a methodological approach of the dynamic analysis of employment through the panel study and lastly, a summary of the Continuous Employment Survey sample design.

**Diagram 1. Survey objectives**



# **I. About the Continuous Employment Survey**

## Background and justification

INEC has conducted surveys aimed to households since 1965 based on the Central American Program of Household Surveys, which was implemented until 1971, followed by the Timely Household Survey Program (1976-1986) and subsequently with the Household Survey Program for Multiple Purposes (EHPM, in Spanish), which was designed by the end of 1986 and early 1987 and carried out every year in July between 1987 and 2009, and ENAHO which is conducted since July 2010 onwards.

**Diagram 2. Timeline of surveys on dwellings in Costa Rica**



Due to the important changes occurred since the EHPM design in 1986, it was needed to update the survey tools to better reflect the current reality. For this reason, INEC started an improvement and updating process for the Multipurpose household survey in 2005, by which a new conceptual framework for research was built; designed a new sample and a questionnaire allowing to collect information that will provide a clearer and broader view on the new labor market conditions. In 2009, the pilot survey on employment was conducted in order to test its functionality in a definitive way.

Beginning in 2010, additional improvements identified in the pilot survey were introduced and the implementation of the new survey called National Household Survey (ENAHO) was initiated.

The new survey program includes improvements to the conceptual and operational framework underlying the measurement of labor force participation, income and poverty incidence of Costa Rican population, in accordance with the latest international recommendations on this subject, adapted to the Costa Rican reality.

ENAHO makes available the methodological conceptual basis required to improve surveys of employment,

however, it has the disadvantage that there is still a difference among the period of information collection, quarterly reference period of results, type of information collection and method of data collection.

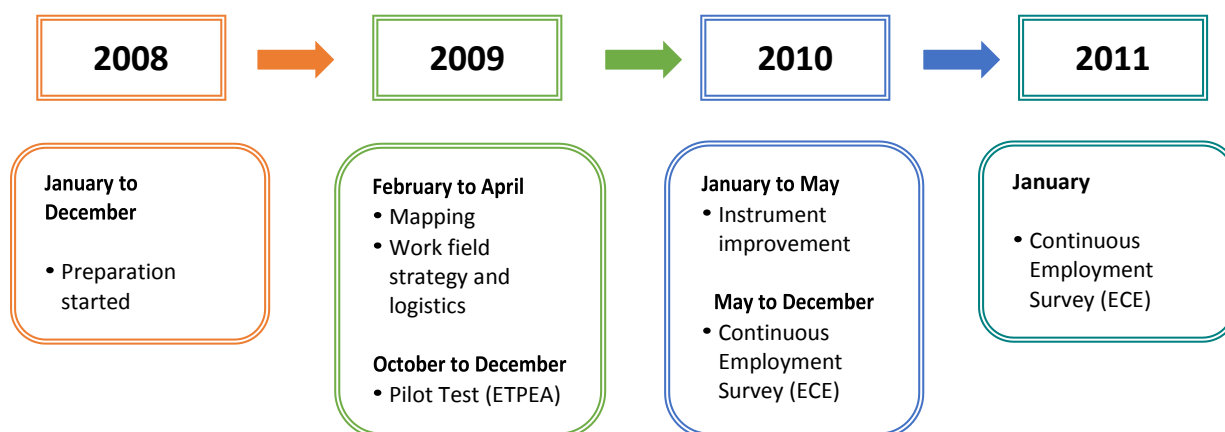
Once defined the ECE technical and operational aspects, INEC, in agreement with the Central Bank of Costa Rica (BCCR), started the project in 2008.

As a first step, once determined financial support and according to the research objectives and available financing, the sample design was established. This included national estimates in urban and rural areas and on a quarterly basis for delivering results.

The following diagram shows the main stages of the survey from its formulation:

In 2008 started the researching organizational and design activities ; in the year 2009 the main objective in the first agreement with the BCCR was the pilot test implementation, which was called “Quarterly Survey of Economically Active Population” (ETPEA), and in 2010, once the procedures and processes of the statistical design and the fieldwork operation logistics were improved, the Continuous Employment Survey that took this name to highlight the continuity of the fieldwork and the rest of the processes was launched.

**Diagram 3. Stages of the Continuous Employment Survey**



## Characteristics of the Continuous Employment Survey

"A continuous survey consists on a series of survey "cycles", each of them aimed to produce independent estimates involving a specific period of time. Its basic use is to provide information in order to obtain labor force indicators to measure the trend, cyclical and seasonal variations of them. "The main characteristic of a continuous survey is that the fieldwork is performed continuously throughout the year, which is why the information is obtained through a mobile time reference (period of time immediately prior to the interview) and therefore variable from one informant to another depending on the date of the interview " (ECLAC 2001).

The advantages and disadvantages of a continuous survey will include: (CEPAL, 2001):

- The indicators derived from a continuous survey correspond to an average of the workforce in the quarter.
- Weekly collection allows collecting seasonal variations and eliminating the effects of the reference period.
- This system shortens the estimation period.

- The small size, specialization and stability of the field equipment contribute to optimally apply training processes, supervision and quality control.

Additionally, a better distribution of tasks, displacement optimization, greater control over the job execution and permanent feedback between field and office staff.

- Rejections are diminished since the field team can establish permanent contacts in the community.
- Training efforts are reduced in every stage, since the same staff will remain in it, while developing various research activities for a given period of time. Training will be then carried out as reinforcement, if changes in methodology or new variables, modules or procedures were included.
- This system allows establishing overlapping and rotation patterns of the sample, which opens up the possibility of examining labor variables such as flows and create change indicators.

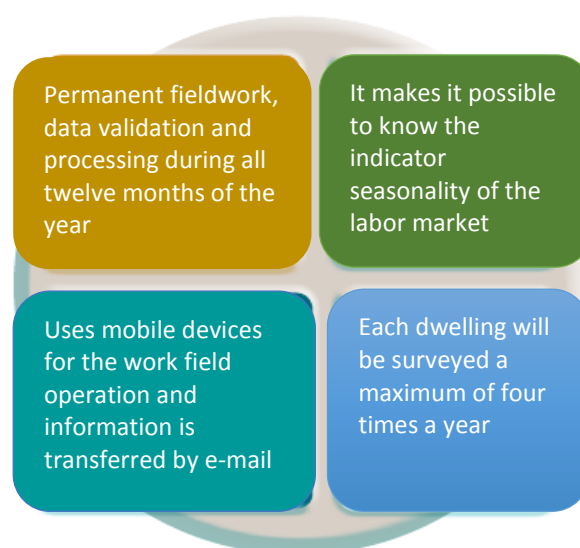
However, statistical disadvantages presented by the continuous survey are:

- This survey specializes in the in labor force measurement, which makes it necessary to find an additional strategy for the inclusion of modules.
- Specialization and continuity of fieldwork staff without adequate resting periods could be negative for the research.

Being ECE a longitudinal and continuous type of survey, its methodological and operating procedure provides better control in the processes, works with continuously trained staff recruited in their place of residence (such as area supervisors, interviewers and drivers).

However, it requires a continuous process of preparation, collection, processing and analysis of results, making the survey more complex, so it was required to precisely define all the operational and administrative aspects before initiating its implementation.

**Diagram 4. ECE characterization**



As the conceptual basis of the ECE that is based on the ENAHO, the basic flow of information and conceptual comparability between the main indicators of employment and labor income remains among the ENAHO and ECE.

However, there are several different variables, among which are: the concept of country resident based on the National Accounts System Manual; a distinction is also made between the company where the person works and the company that pays him (Outsourcing or other types of employment); characteristics of previous jobs, among others.

As to those under the age of 15, information about name, age, sex, place of birth and habitual residence is searched.

In addition, it should be noted that ECE encodes the economic activities with the International Standard Industrial

Classification of All Economic Activities (CIIU, Spanish) revision 4, which allows a more accurate analysis concerning the Organization of 21 categories of activities rather than the 17 in ISIC revision 3.

It is essential for the survey to constantly update mapping, including changes in the number of dwellings, taking into account changes in the number of dwellings to the interior of the selected censal segments (creation of residential areas, household demolition among others), process that is used as input to expand the population, as well as it takes part of the survey quality standards as well as it keeps the sample up-to-date each quarter

In addition to the above, the ECE implementation provides continuous, systematic and timely information relating to the variables mentioned, it can also serve as a source of reference for government, university, or research institutions, as well as to companies and private institutions, chambers and associations interested in issues related to the labor market.



## **II. Important concepts**

## Universe and units of analysis

In the case of ECE, the unit of observation, corresponds to the dwelling and its residents, the study universe, is made up by private households in the country and the people living in them.

This type of study is performed on a set of dwellings that contain households located in the national territory. The dwelling sample is selected through statistical techniques, so that the information obtained from that group reflects the reality of the universe units.

Below are some basic concepts:

### Dwelling

It is the physical structure that humans use to sleep, prepare, and consume their food; as well as to protect them from adverse weather conditions. There are individual and collective dwellings<sup>2</sup>. For ECE purposes, individual dwellings are examined.

### Individual dwelling

It is a separate and independent room that is intended to accommodate one or more private households. Individual dwelling has direct access; i.e. Residents don't need to pass through another housing to access it. They are also

considered as such, hotel rooms or hostels where there are usual residents.

### Household

It is the single person or group of people, who meet the following characteristics:

- May or may not have family ties.
- Habitual residents of the dwelling.
- Participate in planning and using the same budget.
- Lead a life in common.
- Produce and consume their food in common.

A dwelling may be occupied by one or more households. Likewise, habitual household residents are called household members.

### Type of informant

The informant must be a person aged 15 or over, having a broad knowledge of the socio-demographic and economic characteristics that involve all other members of the household. There are 4 types of informants:

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<sup>2</sup> A dwelling is considered collective when it is inhabited by a group of people without family ties among themselves, living life in common due to

discipline, health, education or religion reasons. If it is for work, it is considered only if there are less than five households in the dwelling.

*General informant:* Person aged 15 or over who is very much familiar with the household and its members, this informant normally fills out those sections about household in general.

*Self-informant:* Household member aged 15 or over who provides his own information. .

*Another household informant:* Household Member aged 15 or over who submits socio-economic information about the other household members.

*Out of household informant:*

It is a person aged 15 or over who is familiar with the members of the selected household and who is also authorized to submit it. This type of informant is called to an interview only when the household occupants are absent.

### **Habitual dwelling resident**

It is the person who usually lives in a dwelling, provided that he has lived there for over six months at the time of the interview. However, it will be considered as habitual resident anyone who has lived or stayed in the dwelling for six months or less, or intends to remain living there and has no other place to take up residence. In the same way, whoever are temporarily absent from the dwelling for circumstantial reasons but his absence will not exceed six months.

### **Non-habitual dwelling resident**

It is the person or group of people who are temporarily living in the dwelling under special or circumstantial reasons, and that have lived in the selected dwelling for six months or less at the time of the interview, but whose fixed residence is a

different dwelling in or out of the country. It is worth noting these residents will only be taken into account for specific studies and not for the final analysis.

## **Main variables researched**

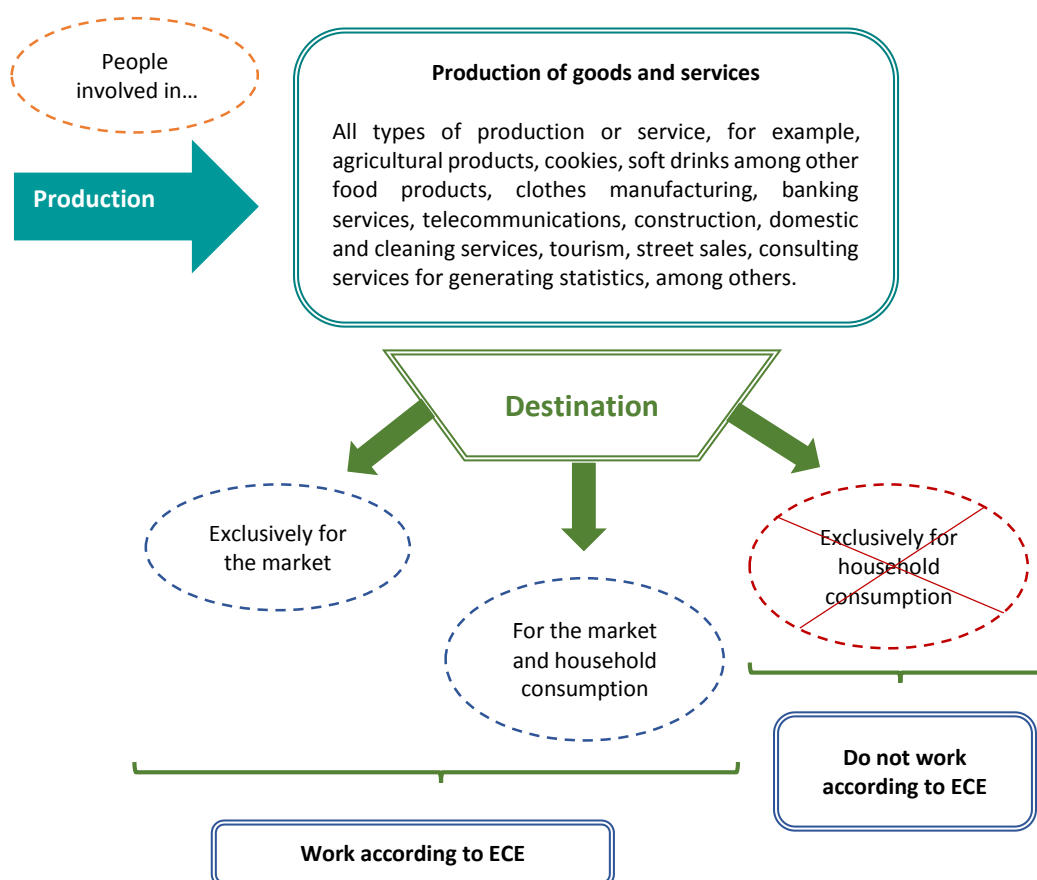
This section presents the main variables investigated in a continuous employment survey.

### **1- Economic activity**

Economic activity is defined based on the concept of the 1993 System of National Accounts (SCN93), in which the following actions are considered as economic activity:

- Production of all goods, individual or collective services provided, or intended to supply to units other than those that produce them.
- Production of domestic and personal services by paid domestic service.



**Diagram 5. Economic activity definition**

Thus, participation in economic activity, involves that the goods or services produced must be aimed to other units (individuals, companies or institutions) in the following ways:

- Sold at profitable prices.
- Bartered for other goods, services or assets, given to employees as compensation in kind or used to make other payments in kind.
- Stored at the unit producer as inventory before its eventual sale,

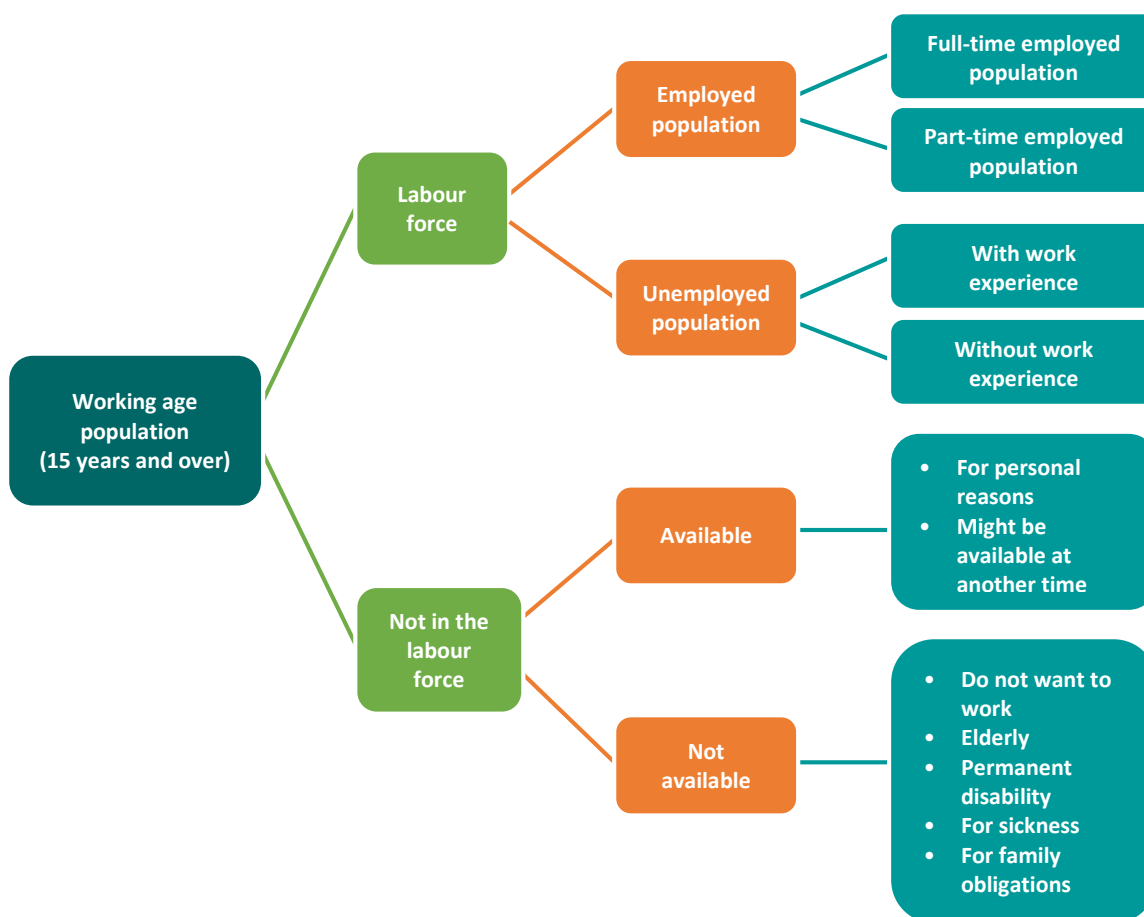
bartered or used in another part of the process.

- Supplied to other establishments from the same enterprise to be used by them as intermediate inputs.
- Provided free of charge or sold at reduced prices by non-profit institutions.
- Used for self-consumption, provided that part of the production is destined to sales or barter.

## 2- Activity condition

Classifies people based on working-age according to their involvement in the labor market, whether or not they have performed or searched for an economic activity during the reference period. The activity condition concept classifies people in two general areas: population in the labour force and population not in the labour force.

**Diagram 6. Population's activity condition**



### 3- Working age population

Population aged 15 or over currently residing in the country which is considered suitable for productive functions. It is divided into labor force and out of labor force.

### 4- Labour Force (FT) or economically active population

It is the group of people aged 15 or over who participated in the production of economic goods and services and were open to do so. It is made up by the employed and unemployed population.

### 5- Employed population

Includes the people in the work force who participated (worked) in the production of economic goods and services at least one hour during the reference week.

It also includes persons who despite having work did not carry it out in the reference week for some special reasons (strike, disability, lack of supplies or clients, weather conditions, among others); and, in addition, the inactivity period did not exceed the time limits established by the ENAHO, i.e. one month.

### 6- Unemployed population

People in the labor force who were unemployed during the reference week, available to participate in the production of economic goods and services, looked for work but did not find it, although took concrete searching steps during the last four weeks.

In accordance with the new concept of ENAHO, those persons who did not work the week before the interview are also

considered unemployed but available to do so. They did not look for work for special situations such as the following:

- They had found it before the reference period and expect to start working on the next days.
- They are waiting to restart a temporarily suspended activity operations, whose inactivity period is less than a month.
- They are waiting for previous applications.

Unemployed are subdivided into people with or without work experience:

*Unemployed with work experience:* this group consists of the unemployed people with previous work experience; that is, those who had worked before the reference period.

*Unemployed without work experience:* Consists on unemployed people who have no work experience, i.e. first time job-seekers.

### 7- Not in the labour force population

Household members who were not employed in the reference week and who had not looked for any job in the four weeks preceding the interview.

This category includes:

#### **Not in the labour force available population:**

Persons who are available for work, but did not look for job because they think that they will not find it; these are known as "discouraged".

The inactive population available for work includes:

*Discouraged population not in the labour force:* Considers the person who is available for work, however, got tired of looking for job, and thinks there is no work in the area; the place where he is currently working is temporarily closed, or, is waiting until any job vacancies are available; among other reasons.

*Not in the labour force population who is interested in working, but with personal impediments:* People willing to work, but with disability, such as illness or accident resulting in temporary disability; attending to any educational institution whose schedule is incompatible with a prospective employment.

#### **Not in the labour force not available population:**

Unavailable persons unwilling to work and who did not look for job during the reference period.

Unavailable population out of the labour force are classified in those unwilling to work, elderly or with disabilities, family responsibilities, study purposes and personal reasons, or else, preferring to do so at another time.

### **8- Characteristics of employed population**

#### **Main job**

A person may have more than one job, the main job is the one that person devotes as much time, or more hours actually worked. This does not necessarily coincide with which generates greater income.

#### **Secondary job**

It is the job to which the person devotes fewer hours than another employment. If the person has more than three jobs, the secondary employment will be that one to which he devotes more hours in comparison with the third one.

To calculate the working income, first and second jobs are specifically examined, as well as any other additional jobs in an aggregate manner.

#### **Outsourcing**

It is the process by which a given enterprise allocates funds for an external enterprise to provide them with services, by means of a contract. "This modality occurs especially when requiring specialized companies. For survey purposes, the most important thing is that the employed person will be working or providing service on a company premises different from which pays his wage and provides staff to the first one.

#### **Branches of economic activities**

It is a statistical classification, which allows locating the worker's company, establishment, business or farm within an economy sector, according to the kind of goods or services produced.

The International Standard Industrial Classification of All Economic Activities, better known as ISIC (CIU, Spanish) is taken as a reference to classify the branch of economic activity. For the survey purposes it is classified according to the ISIC latest revision 4, adapted to the country.

The ISIC 4 contains 21 major groups or categories:

1. Agriculture, forestry and fishing
2. Mining and quarrying
3. Manufacturing
4. Electricity, gas, steam and air conditioning supply
5. Water supply; sewerage, waste management and remediation activities
6. Construction
7. Wholesale and retail trade; repair of motor vehicles and motorcycles
8. Transportation and storage
9. Accommodation and food service activities
10. Information and communication
11. Financial and insurance activities
12. Real estate activities
13. Professional, scientific and technical activities
14. Administrative and support service activities
15. Public administration and defence; compulsory social security
16. Education
17. Human health and social work activities
18. Arts, entertainment and recreation
19. Other service activities
20. Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use
21. Activities of extraterritorial organizations and bodies

The following selected criteria are available for the classification in the branch of activity:

- If the person works in a production and sales company, priority is

given to the production on the sale.

- When working in a company with two or more activities (establishments), the establishment where the informant operates is encoded. In the case of a person who Works in a company or place other than that which pays his wage, the following criteria will be followed: If the person performs a job in the agricultural sector even if it is outsourced, this is classified into the corresponding branch. However, if he performs any other activity as miscellaneous services, trade, security, among others, and the employer that pays his wage or remuneration is not the same where he works, the branch of services activity corresponds to that what supports him economically.

### **Occupational group**

Classifies the persons according to the type of work they perform or performed, understood as a set of duties undertaken. Based on the Job Classification in Costa Rica, COC 1988, the following categories are used:

- Executive management level of the public administration and private enterprise.
- Professional, scientific and intellectual level.
- Technical and middle level teachers.
- Administrative support.
- On-premise sale and direct service provision.



- “Qualified” levels within Agriculture and fishery.
- “Qualified” craft production, mechanics, construction, graphic arts, and manufactures.
- Machine assembly and operations.
- Unskilled jobs.

### **Occupational group qualification**

This classification organizes people's positions in three big groups according to the level of qualification required: High qualified jobs, which require a professional or technical degree of advanced studies. It includes senior management levels of public administration and enterprise, professional, scientific and intellectual levels, technical and mid- professional levels.

Mid-qualified group comprises positions with a basic level of studies but with some degree of specialization. It includes administrative support, sales premises and direct service provision to people, qualified agricultural and fishery activities, craft production and facility assembly and operation.

Finally, the unskilled job group consists of street vendors, street service workers, sanitation workers, messengers, elevator attendants, farm, construction or any other laborers in the manufacturing sector that do not use machinery or equipment, etc.

### **Institutional sector**

It is formed by institutional resident economic units. More specifically refers to the classification of the establishment where the person works or worked

according to their relationship with the State, depending on whether he belongs to the private or public sector.

This variable has two types of classifications, one that is based on the System of National accounts 1993 (SCN 93) which was expressly requested by the BCCR. The second is based on the ENAHO classification, which in turn is based on that of the Ministry of Finance.

The SCN 93 classification is broken down as follows:

- General government.
- Financial corporations.
- Non-financial corporations.
- Non-profit institutions.
- Households.
- Rest of the world.

On the other hand, ENAHO 2011 classification is the following:

- Public sector: Subdivided into non-financial and financial.
- Private sector: Subdivided into non-profit household and institutional sectors under private control.
- Private business sector for-profit (corporations and quasi-corporations under private control).
- International agencies.

Harmonization of codes was made to match both classifications.

### Status in employment

It refers to the type of production relationship on the job, i.e., workers' ranking in the productive relationship with regard to the labor force utilization and production relations.

They are classified into two major groups, employment-related workers according to independent and salaried type jobs.

The characteristics that differentiate people with **self-employment** jobs are: They work on their own or associated, but are neither subordinate nor depend on an employer or earn a salary, and their direct remuneration depends on the profit or surplus generated by their activity over a period of time.

There are two categories:

- **Own-account workers:** A person with a type of job defined as a 'self-employment job', who works without hiring salaried staff on a permanent basis, although they can eventually hire temporary or casual personnel.
- **Employers:** Person with a type of job defined as a 'self-employment job', who needs to hire one or more workers permanently to develop his/her activity.

#### *Self-employment jobs according to type of enterprise*

Based on the 1993 System of National Accounts, it is possible to recognize self-employed persons according to their type of enterprise: Corporations, quasi-corporations. This classification allows looking into profits on their activity,

establishment, business or enterprise in a differentiated manner.

*Corporations:* People with a self-employment job that have an activity or enterprise registered in the National Property Registry Office under a legal person or corporate name, and which keeps formal accounting, making it easy to determine and report on the profit generated by the business.

*Quasi-corporations:* People with a self-employment job who own an enterprise or activity not registered in the National Property Registry Office, but do keep their business accounts formally. They can be registered as natural persons, and may be able to determine and declare the profits derived from their activity.

*Non-corporations:* People with a self-employment job who have not registered their activity as legal entity yet, and furthermore, do not keep accounting of income for their establishment or business, so most of the time is difficult to separate production for household consumption, and therefore difficult to determine profits.

People with type of **paid employment** jobs are characterized by being subordinate to a boss and depend directly or indirectly from that employer's decisions and their remuneration is perceived as an amount per month, week, hour, piecework, or any other payment period. The categories are:

- **Employees:** This type of employment includes persons who depend on an employer and not on the profits earned by the

entity where they work.

- **Domestic service:** It has the same characteristics of the previous category, but differs in that they work exclusively on dependency relationship with one or several households, in which neither the household nor the person providing the service constitute a business or economic unit. They can partially provide work tools and demonstrate a relative autonomy in pricing or value of the service supplied, but they have a continuity in the provision of domestic services; in other words, there is an explicit or implicit agreement between the household domestic worker and the household, concerning working hours, amount and type of work to be performed, the value of the service and the form of payment.
- **Unpaid workers or contributing workers:** Persons aged 15 or over who participate in any economic activity as help to a family member or acquaintance who has a business or owns an activity (assist an own-account worker), or as help to a family member or acquaintance who works for an employer (assist an employee), all this without receiving any payment, neither money nor in-kind.

### Size of the establishment

It is defined by the number of people who regularly work in the establishment. It should be understood as regular workers

those who work regularly or daily in the workplace. People who are temporarily employed should not be considered within the size of the enterprise excepted those interviewed persons who are not regular workers but are included as such.

### Working hours

Refers to the whole time spent on activities that contribute to the production of goods and services. They are classified into two types: normal hours and actual hours, which are detailed below:

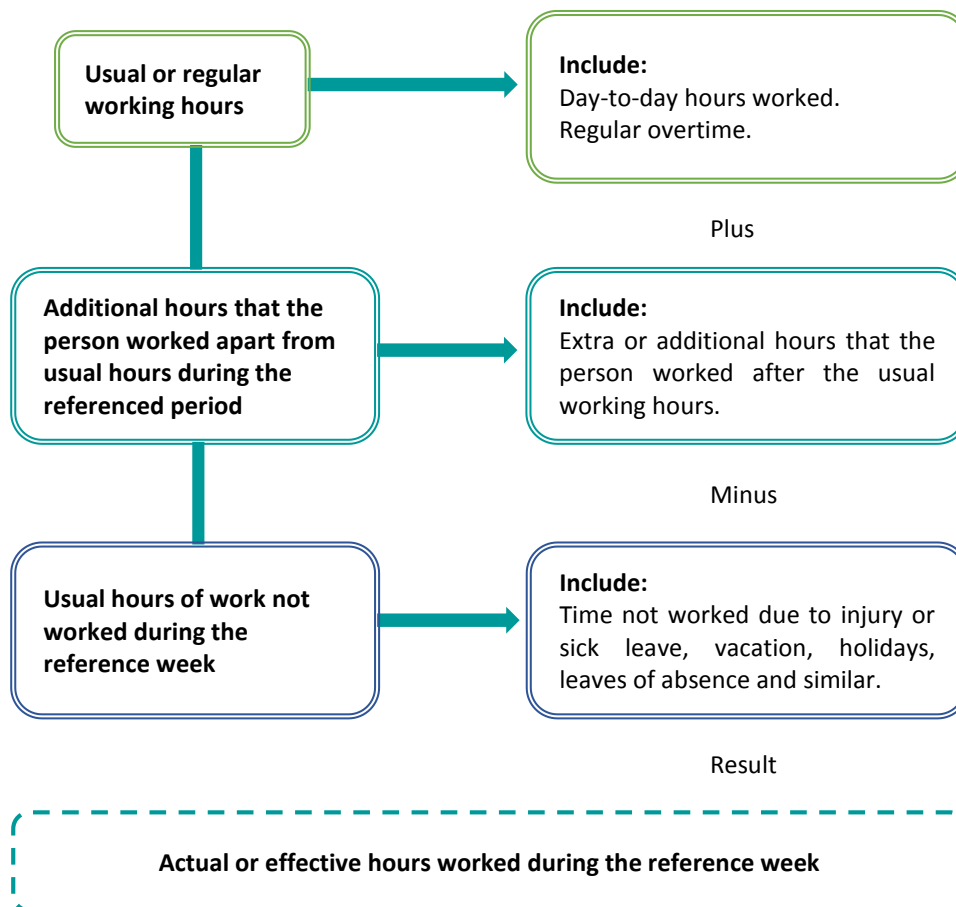
#### Usual hours

Hours usually worked by the person according to the schedule for which he was hired; It includes regular overtime, and hours not worked due to disease, permit, holiday are not discounted. If self-employed, normal hours correspond to the time worked on a regular basis according to its own work schedule.

#### Actual hours

Number of hours actually worked by the person in their employment, including overtime (paid or not) during the reference period, excluding absence for non-work purposes (deducted or not from payment).

The following diagram summarizes the conceptualization of these hours:

**Diagram 7. Types of hours**

## 9- Work quality

ECE determines work quality, by combining the basic variables that define and characterize employed population with other variables that determine levels of satisfaction or dissatisfaction with the work performed, mainly, with the actual hours during the reference week.

### Working time

Working time indicators related to actual hours worked during the reference week. Employed persons can be classified according to the following categories:

#### Full-time employed population:

Employed population present for work during the reference week and who worked between 40 and 48 actual hours or usually work between 40 and 48 hours, even though they did not show up during the reference week.

#### Part-time employed population:

Includes those employed population present for work during the reference week and worked less than 40 actual hours or either employed who did not show up during the reference week, but normally work less than 40 hours.

**Underemployed population:** Employed population present for work during the reference week and worked more than 48 actual hours, or employed who did not show up to work during the reference week, but usually work more than 48 hours.

### **Direct Social Security Insurance**

It establishes that any employed persons get social security insurance from their employers. Corresponds to those population with social security who are salaried, self-employed or through agreements.

### **Number of minimum wages**

The minimum wage is the remuneration legally established per working period which employers must pay their employees for their work. In Costa Rica this is set by the Ministry of Labor and Social Security. There are two major categories to define the employment profile: Those earning more than the minimum wage and those earning less, however, having more subgroups of employed population with respect to wage, it is possible to observe this population distribution as regards of work income.

### **Job search to move**

Covers features of employment condition which limit a worker's capabilities and well-being in accordance with criteria deemed appropriate, hence, expresses his desire and availability to accept any other employment that best suits his needs and has even taken some efforts to change job.

### **Time-related underemployment**

It identifies if the employed person wants to extend the working time during the reference week and besides, if the person had had the willingness to have extended their workday. So that the employed population can be classified into satisfied or dissatisfied with their working time.

### **Employment stability**

The aim is to determine the current job stability of the person being interviewed, either permanent, non-permanent (short or long term) either or casual employment.

*Permanent:* Refers to a job that is contracted for an indefinite period of time.

*Non-permanent:* It is the kind of job where a term contract is established.

*Occasional:* As it names suggests, refers to casual or sporadic jobs.

## **10- Variables and income indicators**

ECE exclusively examines income from work done during the month preceding the survey and considering both the monetary and non-monetary income.

**Primary income:** It is the monthly income received by employed people once compensation for their secondary occupations, if any, has been collected.

These indicators show employment income corresponding to employed and self-employed population. In addition, it is possible to differentiate these incomes as monetary and non-monetary.

**Monetary income:** Payment received in the form of money in return for work done.

**Non-monetary income:** Payment received in the form of products or goods in return for work done. For example: food, housing among others.

### **Employees income**

**Gross income:** Refers to the wage for which the worker was hired without considering any deductions or additional income. .

**Net income:** Base salary minus those deductions allowed by law, social security and income tax. It is a type of monetary income.

**Overtime income:** It is the income received by employed people when working hours over their contracted working time. It is a type of monetary income.

**Income from tips:** This type of income is received by employed persons who provide services. This category includes service tax (10%) and gratuities. It is a type of monetary income.

**In kind income:** It is the monetary equivalent value of all goods and services received as full or partial payment for work done. They are not used exclusively at work and workers can have them available without any restriction during their spare time to meet their personal needs.

**Christmas bonus:** Corresponds to the thirteenth month payment made by the

employer to its employees and is equivalent to the income sum received over the year, divided by twelve.

**School salary:** Defined as the withholding of any salary increase equal to 8,19% of monthly income which is accrued over the year, to be paid before the start of the school year, usually in January. Public sector employees benefit from this type of income mainly.

### **Self-employed income**

#### **Income from corporations and quasi-corporations**

**Income from profit distribution:** It is the amount calculated annually on profits earned from a business activity. It is a type of monetary income.

#### **Income of non-corporations**

It is divided in two sections:

##### **Non-agricultural enterprises:**

*Profit:* This corresponds to the estimated calculation of sales minus costs to produce them.

*Self-supply:* It is the action that occurs when individuals consume goods and services generated by the activity. In other words, it is the part of the production of any business or activity that is left for own consumption rather than sell it.

##### **Agricultural enterprises:**

*Profit:* This corresponds to the estimated calculation between sales during an established production period, minus the investment made at generating them.

***Income from self-consumption:***

Corresponds to the estimated amount equal to the product intended for home consumption. Valuation at the market price is added to the profit from the activity.

**Condition of activity indicators****Activity rate**

It corresponds to the participation percentage in the labor force with respect to the working age population.

**Employment rate**

It is the percentage of employment population with respect to the working age population.

This is the relation between persons who found a job and those in the working age population.

**Unemployment rate**

It is the percentage of unemployment population with respect to the Labor Force (FT).

**Partial employment and unemployment**

It is the rate of partial occupancy and vacancy percentage representing the unemployed and employed population working less than 15 hours per week with respect to the labor force.

**Percentage of employees**

Percentage of the employed population that receives a wage or salary from the economic unit for which they work.

**Inactivity rate**

Percentage of the out-of-labor force population with respect to the working age population.

**General pressure rate**

It is the percentage representing the unemployed and employed population looking for another job with respect to the labor force.

**Underemployed percentage**

Percentage of employed population working less than forty hours per week (time-related underemployment), who are available to work more hours than the currently working.

**Secondary job percentage**

It is the percentage of employed population with a second job.

**Percentage of employment with social security**

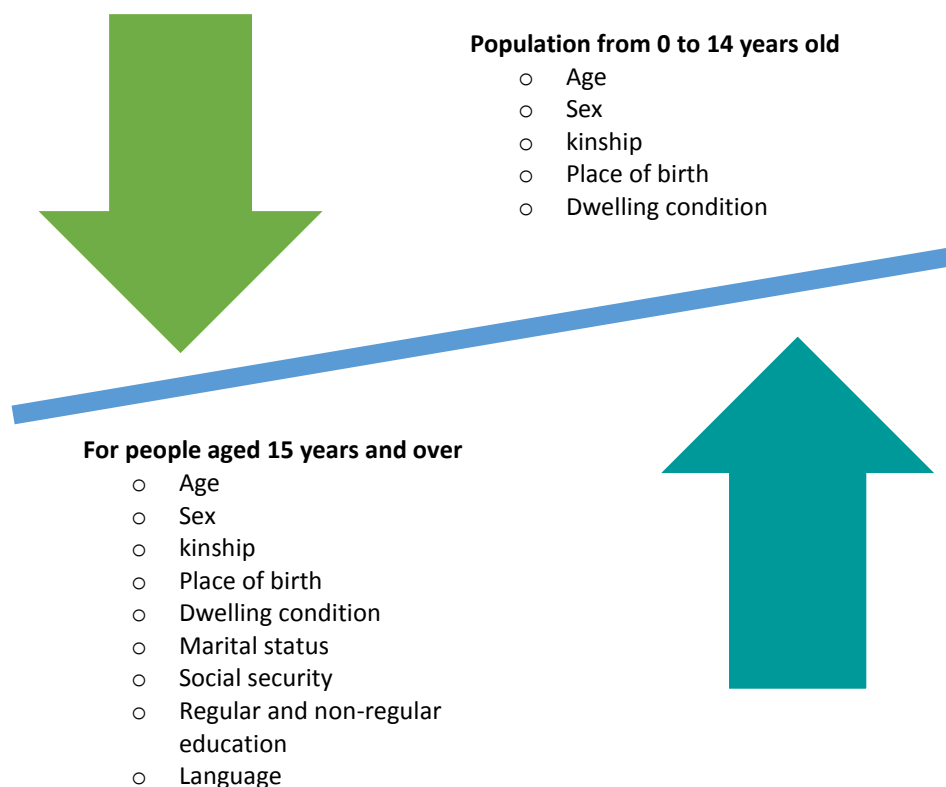
It is the percentage of employed population who receive social security.

**Other important definitions**

Other relevant concepts on socio-demographic characteristics of the population under study are included below.

Such characteristics are totally surveyed to a certain portion of the population, as shown in the following diagram:

**Diagram 8. Socio-demographic characteristics of the population**



### **kinship**

It refers to the relationship or link between the male or female head of household and each of its members.

### **Sex**

Sex is the biological characteristic that distinguishes the people interviewed, whether they are men or women.

### **Age**

It is the years of life at the time of the interview, regardless his/her next birthdate.

### **Marital status**

It is formulated only for persons aged 15 or over, its objective is to know the

persons' marital states in relation to the laws and marriage customs of the country.

### **Place of birth**

Identifies the province or country of birth of each surveyed person, understood as the place where the mother resided at their birth.

### **Resident**

This concept is in accordance with the provisions of the 1993 System of National Accounts (SCN). A person is considered as resident in the national territory, provided that has been living in the country for one year or more at the time of the interview. However, if the person



has lived less time in the country, but he or she intends to settle, will be also considered as resident.

### **Social security**

Its objective is to examine the social insurance condition of the population, i.e., estimating the number of persons covered by different regimes of the Costa Rican Social Security Fund, as well as the population not covered by them. This research is only conducted on persons aged 15 or over.

People may benefit from insurance coverage in different ways:

- Directly, i.e. employee, self-employed, or through agreement. Indirectly, a person insured by a family member with direct insurance or pensioner, or by the State.
- Contributory pension, when people pay contributions to some pension regimes and get benefit.
- Retirees by non-contributory regime, whose the State guarantees health insurance and also a money transfer.
- Other types, such as school group insurance, war pension.

### **Formal education**

Its purpose is to achieve the learner's development of elemental motor and mental skills for his personal life; acquire the basic knowledge in different fields that enable him to have a better understanding of his surroundings; and get the expertise to be part of the

productive sector. This type of education is considered a right in Western societies; therefore, the states are making efforts to enable population to achieve this schooling. It is divided into regular and non-regular education:

*Regular formal education:* It is provided in educational institutions and authorized by the Ministry of Public Education (MEP, Spanish)

*Non-regular or open education:* It includes primary and secondary educational institutions but under programs adapted to special groups of the population, with duration other than that provided for by MEP for the regular school term. i.e., Education taught by levels but organized with contents and duration other than the established. However, it must be authorized by the MEP. Includes centers such as IPEC, private institutes, distance test preparation and the New Opportunities Program, among others.

### **Education assistance**

Allows getting an estimate of the tuition in the different systems of regular education, so there are the following levels of support:

#### *Regular:*

- Elementary: Pre-school, Cycles I and II.
- High School: Cycle II and Diversified.
- College: Technical education or University.
- Special education.

#### *Non-regular:*

- Open education (primary or secondary).

### Level of education

A person's level of instruction corresponds to the higher approved studies within the regular education Cycle, whether he has completed or not elementary, high school, college or University education.

### Approved degree and career (only for people with high school approved)

It refers to the name of the career or major studied, and diplomas awarded. Degrees are classified as follows:

- Technical level or specialist.
- Teacher training diploma or University level
- Technician
- Services
- Bachelor
- Licenciatura
- Major
- Master degree or doctoral studies

Similarly, the career name is also classified based on the International Standard Classification of Education (CINE, Spanish). The following information on other educational specialties is included:

- Education training
- Humanities, Practical Arts and Sports Training
- Social Studies, Trade and Law.
- Natural Science
- Engineering, Industry and Construction
- Agriculture, Forestry and Fishery
- Medicine

### Non-formal or extra-curricular education

Refers to any non-formal or extra-curricular educational programs completed and certified. Once information of both training course title and institution name is given, it is encoded under the CINE classification. Regarding educational institutions the following can be considered:

- The National Training Institute (INA, Spanish)
- Private Institute
- University College
- Public University
- Private University
- Public Institution
- Private enterprise
- Foreign entity

### Proficiency in a second language:

It is requested if the person speaks, reads and writes fluently any other language, like:

- English
- French
- German
- Other

If so, he is asked to indicate which one speaks more frequently.

### General Structure of the Questionnaire:

The Continuous Employment Survey questionnaire consists of 9 sections, in which different characteristics of the population are examined; however, not all sections are totally completed since it depends on each person's characteristics.

The chart below shows a summary of the main objectives from each section:

**Table 1. Questionnaire structure**

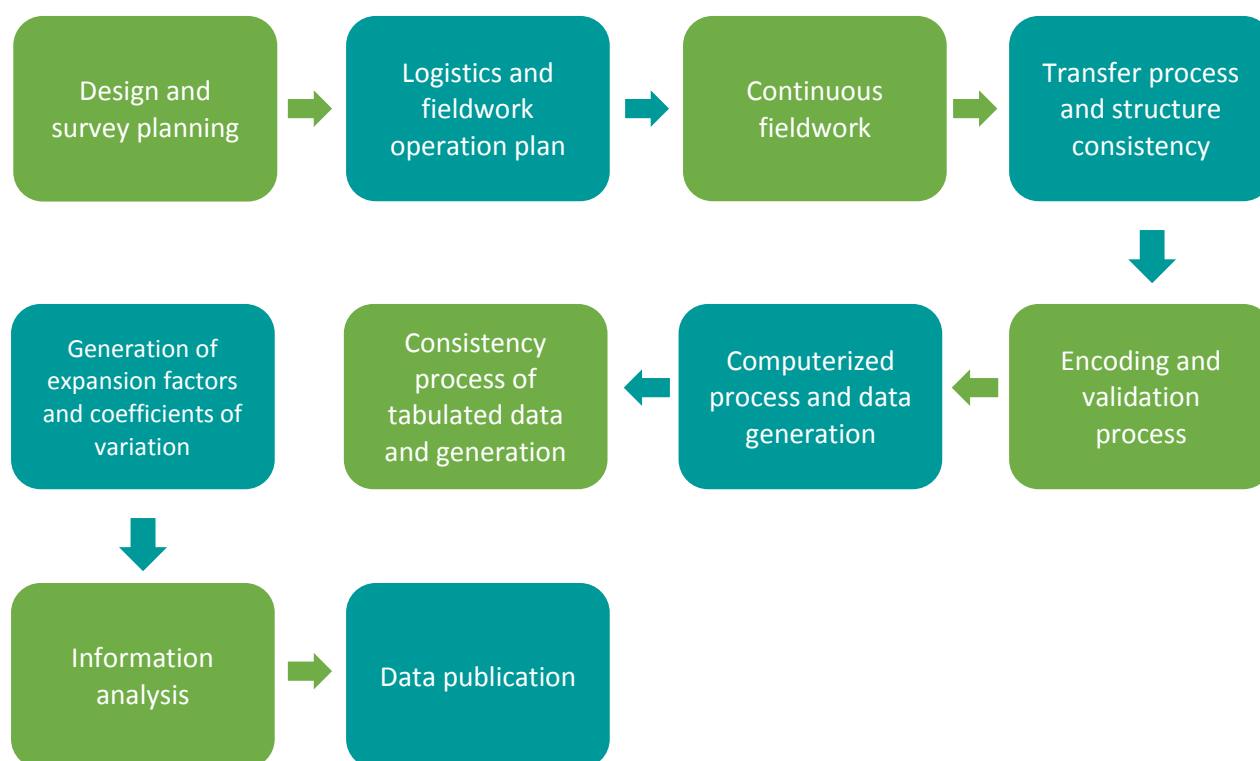
Section	Objective
<i>Section A</i>	Learn about aspects related to structure and behavior of the population under study. Register information about age, sex, education, among others.
<i>Section B</i>	Classify persons aged 15 and older, according to their activity states: employed, unemployed or economically inactive population.
<i>Section C</i>	Go into detail about the characteristics of people identified in Section B as employed in their main job, and then classify them into: employee or self-employed.
<i>Section D</i>	Identify and characterize people who develop an economic activity or self-employment, such as employers and workers on their own.
<i>Section E</i>	Determine the conditions employed persons have in their main jobs; in terms of length of time worked, working schedules, activities developed, form and period of payment, labor benefits, among others.
<i>Section F</i>	Ask about general characteristics of any secondary jobs the surveyed persons might have.
<i>Section G</i>	Search about inappropriate employment and time-related underemployment that cause critical conditions at work.
<i>Section H</i>	Analyze some labor issues in population affected by unemployment, as well as main obstacles or constraints presented in the labor market.
<i>Section I</i>	Ask about participation in agricultural activities whose production target is exclusively for self-consumption.

# **III. Survey structure**

## Survey structure

Main ECE processes are explained as follows:

**Diagram 9. Processes of the Continuous Employment Survey**



### Design and planning: Pilot survey

A pilot survey that integrated all the processes and procedures was conducted before carrying out the ECE. Its aim was to assess the strategy and logistics of the

fieldwork implementation, statistical designs and tools. This survey was named “Quarterly Survey of economically active population” (ETPEA, Spanish).

ETPEA was implemented in 2009, lasted a total of eight weeks, approximately 2 months, and was conducted nationwide, the segments used were the same that would be used later for the definitive survey with the purpose of evaluating the sample rotation.

It was planned to visit roughly 2500 households per month, i.e. 209 segments. One hundred percent of the selected dwellings were surveyed the first month, seventy five percent of these same households the second month and the remaining twenty-five percent corresponded to new dwellings within the same segment.

As part of the fieldwork logistics, the country was divided into eight areas of work and staff from San Jose and some defined areas was hired in order to test its functionality, the route plan was also tested as well as the workload assigned to each interviewer and the supervisor's duties, among other aspects.

In terms of computer systems, the capture on mobile devices, advantages and disadvantages, and interrelationship of the field staff with them were tested. Similarly: assessed, allocation of interviews, and information transfer, among others.

Encoding process, validation, database management, generation of tabulated results and analysis of information were also tested in office. The previous process to data collection took a month and a half.

Its implementation is described as follows:

**Diagram 10. ETPEA implementing stages**



### 1. Research

At this stage the search and study of methodologies and recommendations for this type of statistical surveys was performed, as well consulted national and international experience.

### 2. Design of data collection tools

The questionnaire design led to create a conceptual and operative proposal. It was considered to capture the information both through electronic mobile devices and the traditional way, that is, on paper, so questionnaire designs and applications for the two data collection mechanisms were made.

### 3. Pilot survey organization and planning

Includes several aspects:

Organization and preparation of the pilot test includes various aspects among which are:

**Mapping:** It was preceded to the mapping and registry of buildings and dwellings (REV) from the 752 segments corresponding to a sample of the future ECE, for which was necessary to execute the work field operation with the help of cartographers, and digitize the maps.

**Field strategy:** To do the field operation, the country divided into eight working zones and each of them was assigned the fieldwork staff. Logistics also included staff mobilization within each of these geographical areas

**Staff recruitment:** Took place in each of the geographical areas of the work defined, two tests were taken: the first contained questions to assess the person's performance and fluidity to conduct the interview; and the second on basic operation of Windows (simulating information backup and data transfer). Once these tests were taken, the staff selected was trained to determine the most capable supervisors and interviewers for each task, according to their performance. Validators were recruited using the same criteria and others. An extra margin of personnel was always considered for staff replacement.

**Staff Training:** Two-week training on conceptual aspects and the correct application of the questionnaire, both on mobile devices and paper was carried out. Trainees were also instructed in cartographic management to learn how to locate selected dwellings, on the back and the transfer of information. Likewise,

evaluations on each of the examinations points of the program were made.

Supervisor and Interviewer profile: Staff selection was based on the proficiency in their performance with informants and in the use of mobile devices, in addition to the scores obtained in the tests.

#### 4. Pilot survey implementation

A field operation for two months initiated once mapping, staff hiring and training were completed. There was also constant monitoring in the field to observe and analyze every assessment aspect in accordance with the test objectives.

#### 5. Tools Reinforcement

Operational and methodological procedures used during this stage were measured after finishing the pilot survey in the field operation, For this purpose, staff who participated in completing assessments and promoted discussions met, whose experience, provided feedback to the ECE technical team by identifying aspects and procedures needed to be strengthened, and so remedy the weaknesses to start the final and definite survey in late May of 2010.

#### Continuous survey organization: Stages prior to implementation.

The following diagram shows pre- and post-organizational stages to the Continuous Employment Survey:

**Diagram 11. ECE stages**

### Improvement and redefinition of tools

An important fact about the pilot survey is that it allowed us to understand those implications a continuous survey entails, both during planning and implementing.

Therefore, once reviewed the methodological and operative procedures implemented and recommendations resulting from the pilot survey, proceeded to improve and organize all the approaches for the definite survey execution. This improvement included redefinition of collection tools in order to incorporate recommendations related to some questions effectiveness.

### Survey Organization

In terms of the survey organization, the following aspects are considered among others:

#### • Selection and Recruitment

The procedure was basically the same as used with the pilot survey, however, the search strategy and staff number required varied according to prior experience. Staff selection process and recruitment initiated two months before implementing the survey; it was preceded in the following manner:

1. The first step was to determine the vocational profile of the personnel to hire: Supervisors, interviewers and drivers. Supervisors and interviewers should be skilled in computing and mobile devices open to get interviews easily, responsible and reliable, with initiative, as well having approved the training with high scores. On the other hand, drivers should have experience at operating vehicles and basic knowledge of mechanics.
2. Advertisements with the profile required were published in newspapers, on the Internet, at bus stops, churches and radio stations in the geographical areas.
3. Once received all job applications proceeded to the interviews in the corresponding area. Two tests were applied: one on personal development and the other on computing.
4. Next step was training, which will be discussed in more detail later. The number of people convened was greater than the expected to be hired, with the purpose of



choosing people with higher performance in training, as well as to anticipate for possible desertion.

5. After people were trained, we proceeded to select those who demonstrated higher performance and competence that matched with the required profile. Accordingly, supervisors, interviewers and drivers were recruited for every zone.

- **Training Process**

The staff training for the Continuous survey involved the organization and development of three training processes aimed to: interviewers, zone supervisors and drivers.

Those three trainings were conducted in a center that provided accommodation, food and suitable facilities for the process.

They are described as follows:

### **Interviewers' training**

The training lasted two weeks, from April 26th to May 7th, 2010, and classes were taught in a masterly way supported by Power Point presentations, as well as interactive activities and practices that allowed them to apply the acquired knowledge. Additionally, evaluations were used as parameter to assess mastery of each of the topics covered.

The activity began with a presentation on general aspects of INEC, such as their reason for existence, functions and legal framework, as well as an overview of the

project, duties and rights of the staff under training, questionnaire structure, types of questions, and interview technique.

Subsequently, every section of the questionnaire was discussed in order to state each question objective and indicate the way how they had to be formulated.

In addition, throughout the two weeks, assessments were made to determine the most suitable candidates for the positions required. Similarly, the IT team attended training on several occasions to explain about the use of the PDA and information transfer. It is worth mentioning that mobile devices were provided during the second week, so the staff could familiarize with their use. On the last day of training, personnel from the Administrative and Finance Division visited to give them a lecture about aspects the staff should know in case of being hired, such as working hours, wage, absence procedure, late arrival, sick leave, proper use of vehicles, among others. On that same day, officials from the ECE Human Resources, Procurement, Finance and Administrative units also attended.

From this training, interviewers and supervisors were elected. These would have a special training, which is detailed below.

There is currently another type of training for one week only. This form of training is performed when an interviewer quits and it is necessary to replace it. It can be held in the zone, or main branch, depending on the circumstances.

### **Supervisors' training in the zone.**

Supervisors' training in the zone was held from 17 to 21 May of 2010 and carried out in the same manner as for the interviewers.

This involved a planning and preparation process, led by the team in charge of the field work. Area supervisors, as already mentioned, were chosen according to their performance during the interviewers' training. Among the topics covered are:

- Supervisor area's tasks, duties and rights.
- Fieldwork implications, materials and maps.
- Mapping and sampling for sample updating.
- Route plan to follow.
- Workload assigned to the interviewer. Information transfer.
- Computer applications for the field review. Communication with the Office and administrative procedures.

### **Drivers' training**

Simultaneously to the supervisors' training, the Mobile Team (drivers) was instructed. ECE and Service and Maintenance personnel participated in this training. Among the aspects discussed were:

- Project objectives.
- Drivers' duties and rights.
- Regulations and formalities related to the vehicles.
- Use of vehicles, electronic fuel cards.
- Delivery of reports.
- Use and importance of location and vehicle tracking devices.
- **Improvement of designs and tools**

Another task performed before the survey implementation, was the improvement of its tools, such as training material, manuals, presentations, tests, as well as the questionnaire. Similarly, applications and computer systems were improved for its good performance in the final survey.

## **ECE implementation**

The continuous survey implementation began on 31 May 2010, and it has involved a series of processes, detailed below:

### **Fieldwork operation process**

Fieldwork operation is the process whereby the information provided by the households selected for the survey sample is obtained. In order that this

fieldwork process was as effective as possible, the first step was to make a study of the distribution and location of the survey segments to define the strategy to follow.

From February to April 2009 a mapping procedure was carried out on the 752 segments of the Survey fieldwork; this consisted on identifying key locations close to segments and households existing at that time in the area, with the purpose of selecting dwellings which were to visit according to the thirteen weeks set forth in the sample design. This procedure was developed by some cartographers and reviewers who plotted on a map and listed the number of dwellings.

After implementation, and given this was a continuous survey, it was necessary to decentralize work by establishing strategic points or geographic areas with regional headquarters each, and to hire staff residing there, which allows to benefit from their knowledge on the geographical location where the work is done, as well as minimizes costs by reducing travel expenses (tickets, food and lodging).

This way, the country was divided into nine large geographic areas or fieldwork. These areas were chosen as they are important cities in the country, due to their proximity to suitable spots for data transfer, and because they cluster great part of the sample in the area. These strategic points are represented in diagram 12:

**Diagram 12 Strategic areas within the country**



Once established the strategic points proceeded to carry out the master document called "Route Plan", which consists on a systematization of the work plan to implement, according to each zone. It contains the places where the working group has to visit day by day, kilometers that must travel and important notes concerning payment or non-payment of lodging or food; this document is useful for both field personnel and administrative staff, since it helps to prepare the travel expenses and extra hour payment in advance.

Staff geographical distribution and recruitment was according to the workload and segment allocation, so that there was no downtime during working hours. Some groups are formed by two, three or even four interviewers depending on the area and weekly workload. In total, from 58 to 59 segments are visited per week.

## Zone supervision

The zone supervisor is the person in charge of monitoring the coverage, quality, compliance and accuracy of the information collected in the field.

Since INEC has no regional headquarters, one of the zone supervisors' first tasks was to find a meeting point in the working area, provided with appropriate facilities as well as free internet access available.

The objective was to count on a place to meet every morning and so define the working plan for that day, -check maps, ways to address segments and assign workloads. For this purpose, headquarters of public universities in the area, regional offices of the National Training Institute (INA), municipalities, among others, were previously contacted.

Regarding to the workload, the Technology Team must previously upload to the FTP<sup>3</sup> the corresponding segments to each day, while the zone supervisor downloads and assigns the questionnaires to the interviewers.

Arriving at the segment, the zone supervisor and interviewers must make a general inspection of the place identifying the dwellings to visit. While interviewers are conducting the survey, the supervisor should observe, monitor their work, accompany them to some of the interviews, and update mapping.

Completed the interviews, they are transferred back to the zone supervisor, who makes an overall review through the program on inconsistencies installed in their PC; then, the supervisor makes a data backup copy and transfers it to the FTP. There are two types of data transfer, preliminary, which is carried out on daily interviews and a definite held every Monday each week, when all the interviews conducted along the previous week are transferred.

In addition to the above mentioned tasks, the zone supervisor has the responsibility to fill out the coverage control form, in which should be noted the results of each interview, household head's and interviewer's names as well any other aspect considered as important to indicate. Such control must be done digitally and on the notebook specially designed for this purpose.

Likewise, every two weeks the zone supervisor must send an assessment report on drivers and interviewers, as well include any observations on mapping subjects, the contact office, administrative procedures and general considerations.

The supervisor must have a laptop computer and a data card, with the aim of transferring the information daily from any location in the country, and for the final transfer to the end of the week. It also allows him perform a first check of the quality of the interviews by means of the computer system designed for this

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<sup>3</sup> FTP (File Transfer Protocol) is a network protocol for transferring files between systems connected to a network TCP (Transmission Control Protocol), based on the client-server architecture. From a

computer a client can connect to a server to download or send files, regardless of the operating system used in any computer.

purpose. At the same time, he can also generate monitoring of the number of interviews conducted by each working group interviewer and so detect any inconsistencies.

### **General Supervision**

General supervisors are in charge of controlling and reviewing the different work of teams. Their main duty is to ensure the correct questionnaire application coverage, workload and timetable compliance

They also have to visit the zones to assess the supervisors' and interviewers' performance in the area assigned, clarify any conceptual and operational questions and get feedback from the work processes

To visit the zones, a visit plan was previously elaborated, which included the place to visit and general supervisor in charge of the tour. Its objective is to verify that the route plan has been met, the selected dwellings are being visited, monitor zone supervisors' work and accompany the interviewers to some of their visits to verify the correct application of the questionnaire.

In addition, General supervisors must revisit dwellings, with the objective of evaluating the quality of information, and in turn, provide feedback to supervisors and interviewers in relation to mistakes that might have made.

Some other tasks general supervisors perform are: Check zone supervisors to keep information backup, review coverage controls, and collect material, such as ballots, listings, maps, administrative documents, among others.

When the general supervision task is completed, each supervisor has to submit a report on the most relevant aspects of the tour, including a description of the tasks he and the working group performed in the zone.

### **IT Processes**

IT processes constitute one of the most important aspects of the survey, since most processes depend on a computer basis. In the case of the Continuous Employment Survey all systems were developed by the Computer Information Technology Unit of INEC. It should be mentioned that ECE is the first survey of employment in Costa Rica that uses mobile devices to conduct an interview and enter data in the field.

Some benefits of the use of mobile devices are:

**Table 2. Advantages and benefits at using PDA**

Advantage	Opportunity
Variable pre-encoding	Geographic variables are automatically encoded in field.
Automatic passes	Flow of questions, it passes automatically depending on the response.
Inconsistency programming	Detects errors of response or registration in the field. Information is more consistent or accurate than in a questionnaire on paper.
Information is saved in electronic files	Information transfer from the field to the Office.
Judgment and digitation are omitted	Data is transferred already typed and flows opportunely through the other Survey processes, so it lower costs.

**Table 3. Disadvantages and solutions at using PDA**

Problem	Solution
Battery life	Interviewers are responsible for recharging PDA batteries daily.
Memory card damage that causes total loss of information	It is not allowed saving interviews in the PDA, since they have to be transferred to the supervisor's computer.
Physical damage (bumps and falls) and misuse of applications, which leads to loss of time for data collection.	The supervisor keeps a replacement device for the interviews to use in case of the PDA damage, there's also the option of printing the form and then enter it to the PDA.
Limited memory and storage capacity	The more information is saved in the PDA, the slower it becomes, so the interviewer should be frequently saving the information gathered in the supervisor's computer.

The Computer Team has a number of functions to distribute in order to maintain ECE computing platform under optimal operations.

The first computer activity of the survey was to create a data dictionary<sup>4</sup>, which lists all the elements that are part of the data flow throughout the system. This dictionary is the basis of all applications and programs created.

Some of the applications currently used are:

- PDA data capture
- Field validation
- Office validation
- Telephone capture
- Quality control reports

All applications are developed with the CPro (Census and Survey Processing System) program and in SQL Server 2008 program and are revised and updated as required in the different processes of the survey.

Likewise, the Computer Team is in charge of administering the Survey data by using a system designed in .NET and SQL Server 2008 for processing database, which are assigned and downloaded according to the process, as described below:

### **Transfer process and structure consistency**

Workload included in FTP for every week is entered to each zone supervisors' folder in accordance with the route plan.

Once interviews are carried out and uploaded to the FTP by the zone supervisors, data is downloaded by the administrative system of segments, which generally and automatically verifies and correct data, such as the interview results, determines whether the interview is incomplete, detects errors in questionnaires, registration, structures, sections, among others. And, if necessary, the information is requested again to the field to ensure the integrity of the sample.

### **Subsequent process in the office**

Interviews for the subsequent work field process called Codification and Validation is assigned, and a thorough revision of the data obtained is performed while certain questions are classified to the different areas. After completed this process, interviews are uploaded back to the SQL System, where are condensed into a file to generate a preliminary database in order to continue to the next and final consistency process, which will be explained later for revision.

Finally, once data is revised, databases are created for generating expansion factors, tabulations and others.

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<sup>4</sup> A data dictionary is a set of metadata containing logical and specific characteristics of data that are

to be used in the system programmed, including name, alias, description, variable contents.

In order to perform the above task, the Computer Team of the Survey defined a number of “states” according to the process where the information can be found.

**Table 4 State description of information in Office**

Description	Position
Assigned: Interviews assigned to FTP into each zone supervisor’s folder. Performed from the Office by the Computer Team.	1
Preliminary transfer: Interviews per day. Daily transfer by the zone supervisor.	2
Final or closing transfer: Weekly complete interviews carried out once a week by the zone supervisor.	3
Data consistency process: Final revision of interviews by SASET System	4
Codification and validation process: Assigned weekly, there is a week-lag time in relation to the fieldwork.	5
Encoded /Validated: Final transfer of the encoded and validated interviews	6
Database for tabulations or tables	7

Moreover, the IT process includes some other functions, such as maintenance and repair, of PDAs, computers, among others.

One of the processes that is constantly evolving in the Survey is the control generation using CPro y SQL Server 2008 tools, which allow to ensure the integrity of the sample, and verify the quality and quantity of interviews, with the purpose of improving the response time and the quality of the processes.

Some types of controls are described as follows:

- *Controls to administer the field process:* Prepare reports on the length of interviews, condition of the population activity and trend identification on interviewers.
- Verification of updates for capturing applications used in the field by supervisors, among others, which are intended to



measure the supervisors and interviewers' performance.

- *Controls for the sample integrity:* Identification of inconsistencies, missing interviews, historical control by segment in order to follow up on the results obtained through the survey length of time, controls to measure the consistency of structures and sections over time, among others, all of these in order to control the integrity of the sample selected by the sampling process.
- *Controls to administer the validation process:* identification of inconsistencies in branch of activity and panel over time, changes in activity condition, among others; all of them in order to make data validation and codification task easier, as well as, to improve the validators and encoders job quality.

### Encoding and validation process

After transferring the questionnaires to the FTP, the Computer Team downloads the interviews and assigns them to the encoding and validation process, for their respective data treatment. On average, the workload carried out by the validator consists of six or seven segments per day; Continuous Employment Survey uses three encoders-validators for this process, who are responsible for the review of the information of all the zones as they are transferred to this process.

Encoding is a procedure that involves assigning numerical codes to variables

explored in the Survey, such as the institutional sector, branch of activity, occupational group, and educational expertise.

This code assignment allows counting on quantitative information and characterizing the category of these variables into data analysis. An electronic search code to support the working group labor is available.

After variable encoding mentioned above, the ballot verification stage proceeds; this includes a comprehensive review of the information consistency, known as validation process. The Information is confirmed during this process through a programmed computer system which has approximately 600 consistency rules which allow detecting possible errors. Should they arise, they are corrected in accordance with the guidelines and criteria previously established. At this stage, if required, there can be information capture via telephone.

Once the information is encoded and validated, it is transferred again, by means of computer systems, to the SQL database and files are sent to the server, where later databases are generated in SPSS, to be then assigned to the tabulation process information analysis.

Database, tabulations and analysis generation process.

Survey processes where final results are generated are described below:

### **Final information consistency**

A database in SPSS statistical program is available after the validation process; this allows initiating the statistical treatment of the information. It starts with consistency or clearing of the aggregate information, which consists on creating crosses on variables, analyzing the information flow and data panel; detecting possible errors in the database and correct them, if necessary. In addition, tables and tabulations are analyzed.

### **Tabulation and table creation**

Completed the information consistency, a database with variables applied is created proceeding then to formulate the final tables and tabulations, out of which main indicators of the survey are obtained.

### **Expansion factors and coefficients of variation**

When database and tabulations are set forth, what follows is to transfer that information to sampling process, in order to generate the expansion factors and coefficients of variation.

The expansion factor is interpreted as the number of people representing one person in the sample. It is a figure obtained from a sample expansion, in other words, sampling data is expanded at a total population level, applying the same factor to all persons within the segment. Given the expansion factors per segment, data is transferred back to the final consistency and database generation process for the information analysis.

### **Information analysis**

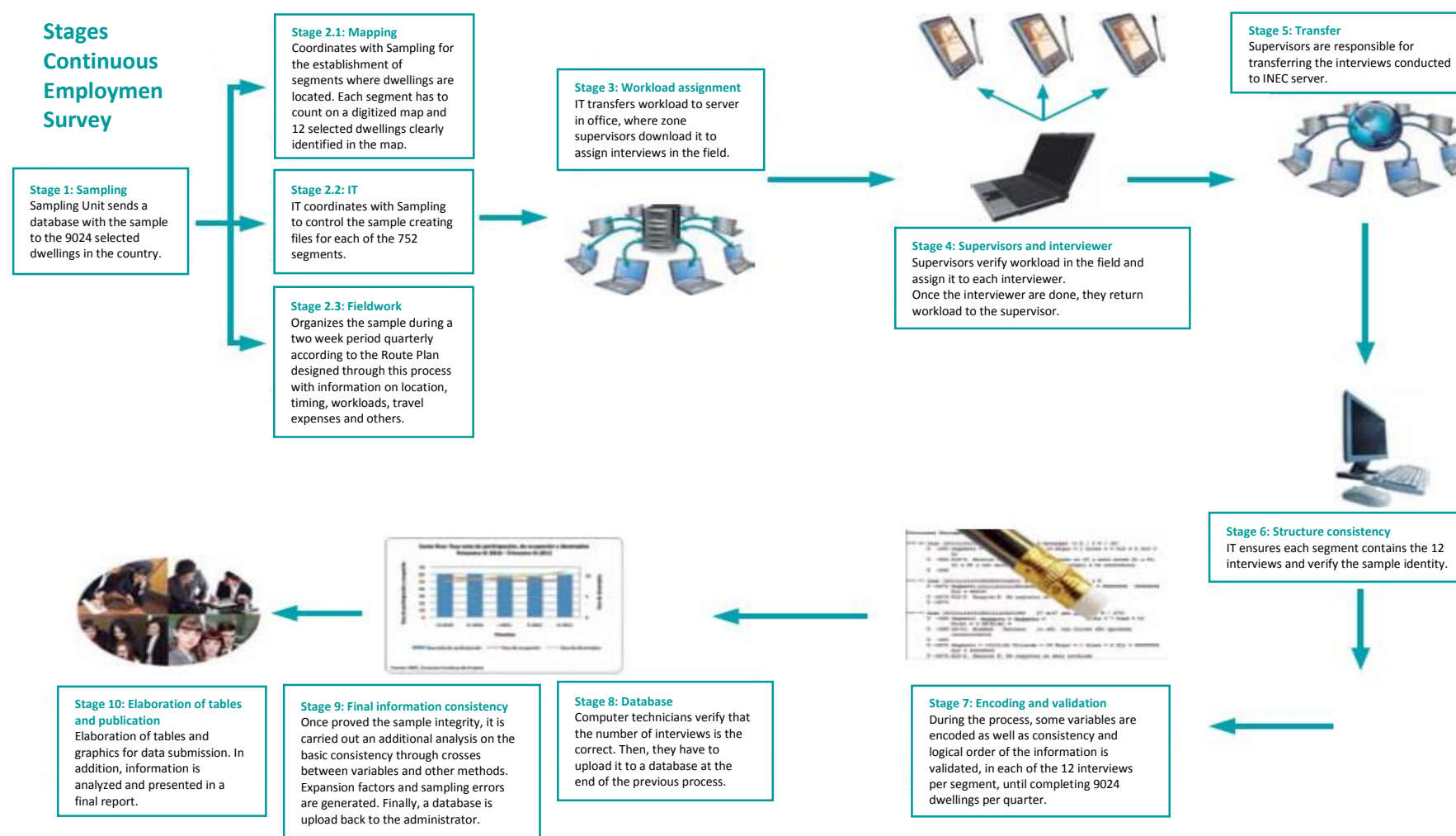
Data analysis is to examine the labor market performance throughout the year through quarterly data that is compared to other indicators of the economic environment in order to present an analysis of the variable behavior resulted from the Survey and its implications for the economy and society in general.

### **Publication of results**

Subsequent to the information analysis, it is proceeded to disseminate the main results obtained by the survey, with respect to the quarterly behavior of the Costa Rican labor market.

The following diagram shows a summary of the processes mentioned above:

Diagram 13. Stages of the Continuous Employment Survey



# **IV. Metodological approach: ECE, a linear survey**

## ECE: A type of semi-panel survey on persons

### Panel Survey

It consists on a collection of information on the same group of test units at various moments in time. Panel studies form part of the methods of longitudinal analysis, by which it is obtained inter-temporary data referred to different moments over time in the same unit of observation.

Such research aims to give follow-up to the group of observation units to determine and quantify changes in features or phenomena of interest over time. It also allows analysis of the trajectory of these features or phenomena, and sees the emergence of new events. For this reason panel surveys are useful for determining the behavior of individuals or households in response to social or economic policies and situations, and thus achieve a more accurate evaluation of these policies or events.

In the specific case of ECE, this monitoring is conducted apart from the same dwellings and persons who inhabit them. When one or more of the dwelling residents moved out, priority is given to the habitual residents of the selected dwelling. For this reason, it is often referred to a semi-panel of observation units.

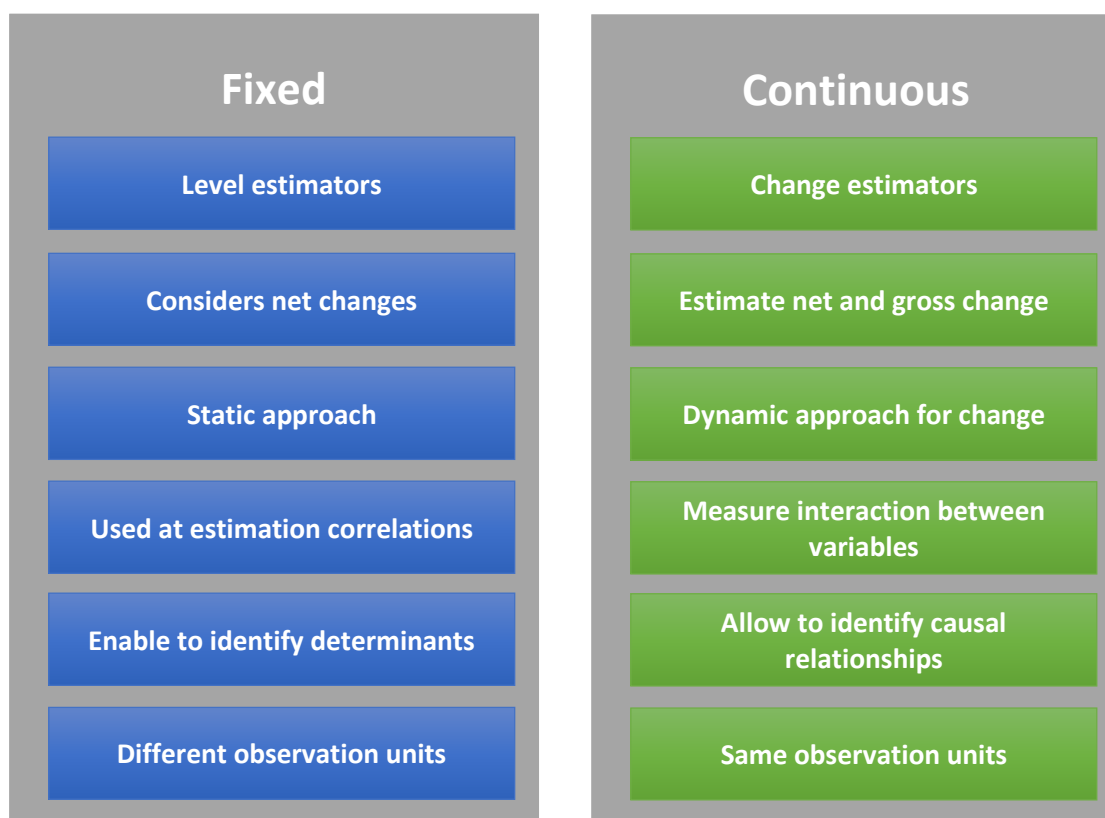
ECE rotates the twenty-five percent of the sample every quarter, this means, that between two surveys around the seventy-five percent of the same dwellings are preserved, among three surveys only the fifty-percent of dwellings match, and among four surveys the twenty-five percent. The panel is lost completely in the fifth survey.

Therefore, the panel analysis is possible only between two consecutive surveys. The panel advantage is that makes it possible to develop quarter over quarter analysis (short-term) of the same findings, which helps to keep control of the variables in time.

Accordingly, ECE sample design is in a position to give answers to questions such as: Are the same employed people from one period to another? What was the change in the person's activity condition from one quarter to another?, among others.

The following diagram shows the main differences between transverse and longitudinal studies:

**Diagram 14. Differences between a fixed and a continuous survey**



**Advantages of the continuous semi-panel survey.**

- Gross and net change analysis: It is one of the most common objectives of longitudinal surveys; it is not possible to measure it with cross-sectional surveys. Gross change refers to the possibility of analyzing changes in the activity condition (from employed to unemployed; from out of the labor force to employed; from one employment to another) from one period to another and with the same population group.
- Average change analysis at unit level: It is possible to follow the behavior of the different unit variables and achieve both aggregated behavioral analysis and individual behavior. This means, a person or group of persons' behavior can be estimated over time.
- Analysis of stability or instability in terms of characteristics: Continuous surveys with many cycles constitute good measures on the stability of different characteristics. Dynamic measures

that capture evolution, transition, duration and repetition of various economic phenomena are implemented.

- Analysis of the characteristics in terms of the events or circumstances, such as frequency, moment, and duration.
- Analysis of the ordinal nature of events, which often helps to clarify problems of causality. Cause and effect relation between two or more variables can be found out through longitudinal data.

### **Disadvantages of the continuous semi-panel survey**

- Conditional information might be given: Refers to the possibility of giving repeated answers on following visits to reduce the time of the interview, or that the informant changes responses to affect the interview length, among other situations.
- Less flexibility at redesigning the research: Since it is a continuous process and to adjust from one design to another is difficult; it becomes troublesome to introduce new issues into the questionnaire, change the sample design or the procedure for information collection.
- The main problem of longitudinal surveys is the difficulty to maintain the same observation units during many rounds of study since

individuals get tired of providing data. This leads to loss of information or limitations to get it. It can also happen that the units of study move to another residence, so follow-up is lost. This is called sample attrition.

- The analysis of a longitudinal survey is more costly.

### **Sample attrition**

A common problem in longitudinal surveys is a percentage loss of the initial sample as new survey rounds are being carried out. This decrease in the original sample over time is known as Sample Attrition.

The reasons why this wear happens can be classified into two types. The first is associated with changes in the dynamics of the population, such as: deaths, by the transfer abroad or elsewhere outside of the selected cluster of individuals involved in the study. The second is because the observation units cannot be located or because the members of selected households refuse to participate.

It is important to consider that ECE corresponds to a semi-panel survey due to change in population, since the panel sample is conducted with people related to dwellings selected in the sample quarter over quarter, and a complete follow-up to people is not developed.

Thus, this might occur:

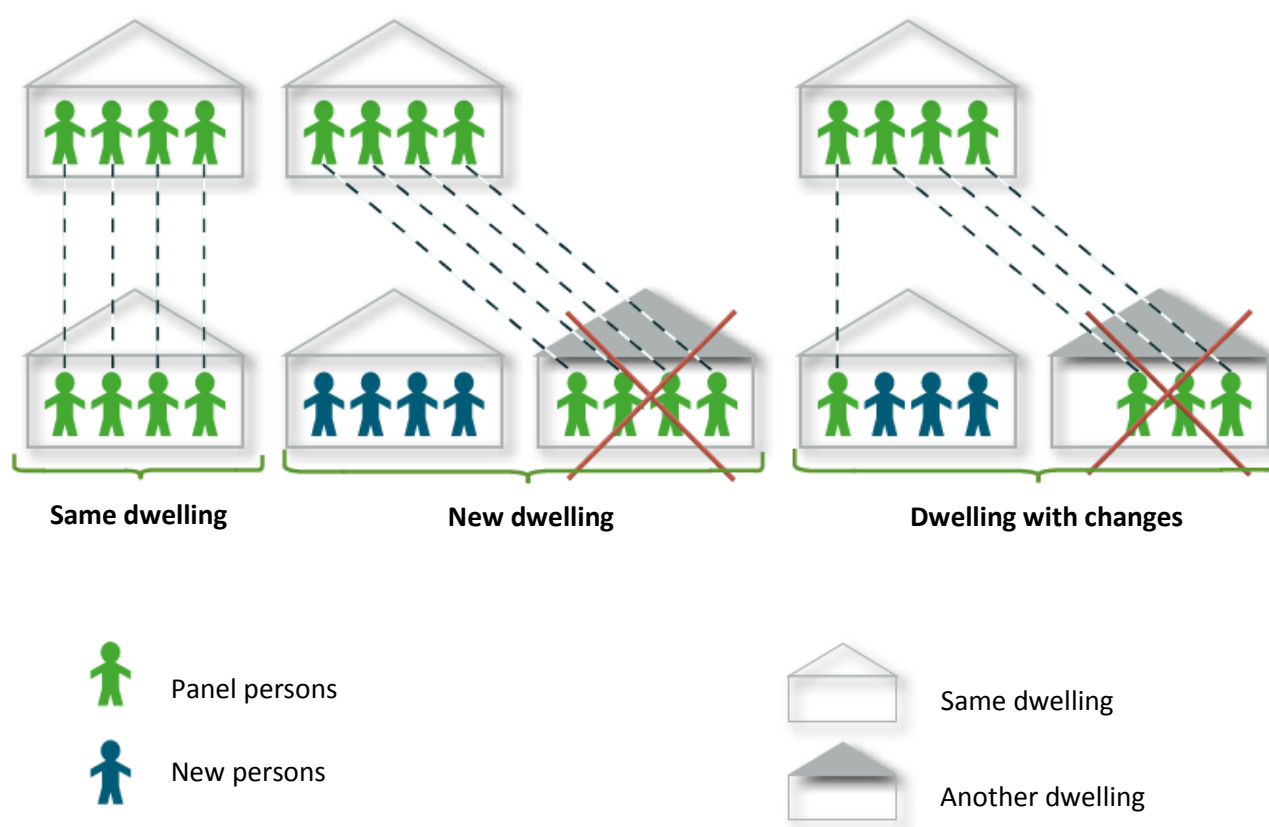
1. **Same dwelling.** Dwelling inhabited is the same from one

quarter to another, and the people involved will constitute the panel.

2. **New dwelling.** If all household members move out of the dwelling for any specific reason, (transfer of persons), this no longer be part of that panel for that quarter, because that dwelling will be inhabit by a new household. This is also called full home movement and causes attrition of the panel sample, the magnitude will be those persons who cease to be part of the panel.

3. **Dwelling with changes.** It is when one or more persons of a dwelling move out, but not the total. In this case, those who remain living in that dwelling continue as part of the panel. This is also referred as people's movement into a dwelling and is considered as a person's loss in the panel sample. However, it is necessary to clarify that if the person returns, he can be part of the panel in the following quarter.

**Diagram 15. Quarter-over-quarter rotation of dwellings**





## Dynamic analysis of the labor market

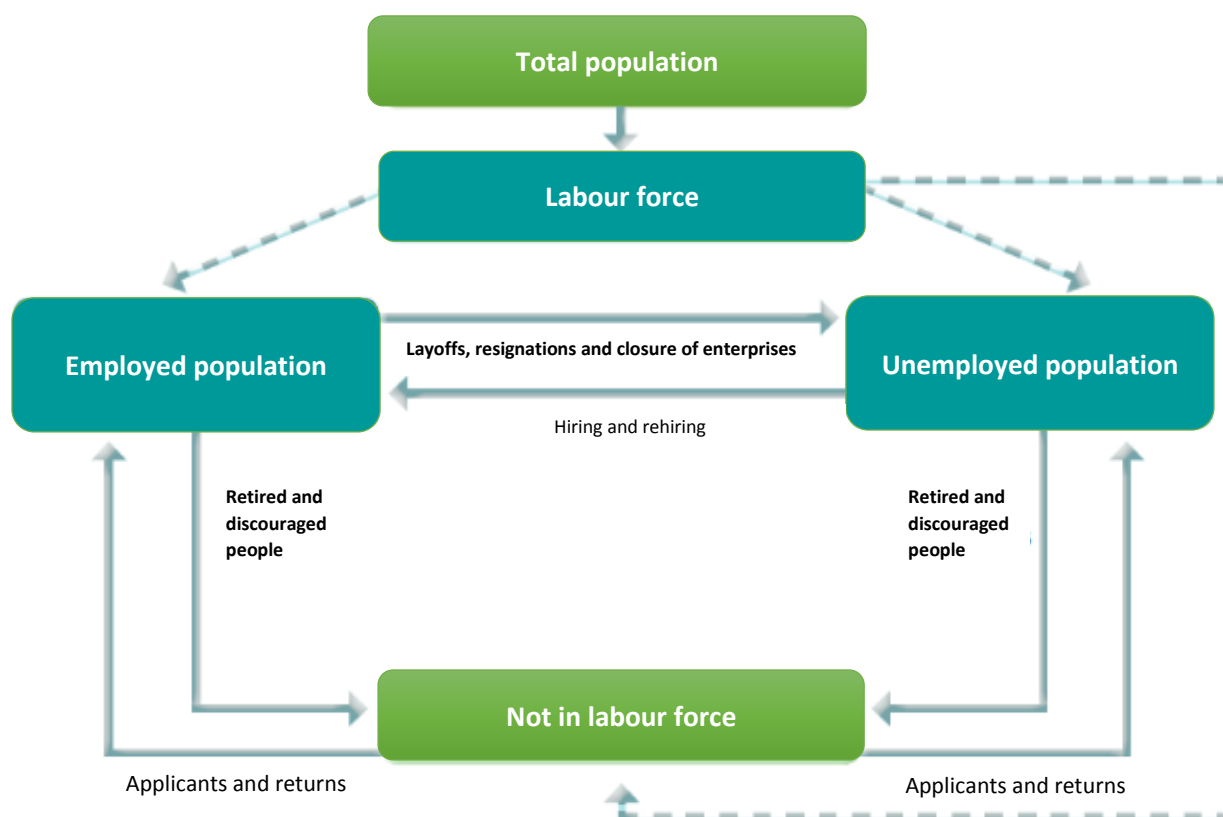
In case that a new person became member of the household included in the panel, will be considered until the next round.

Labor market flows show the process whereby, classified working-age persons move into different employment states over time. (Aguado, 2005).

Market flow description allows analyzing in accurately changes in unemployed, employed and out of the labor force population, and thus, having a clearer vision for the adoption of policies affecting the labor market.

The following diagram shows the dynamics of the labor market.

**Diagram 16. Labor market flows**



Workflows can be represented in a sample way by means of a gross flow matrix of labor market or transition matrix of labor market. . In this matrix, diagonal represents individuals who do not change

their employment states from period to period, while the rest of cells show flows from one states to another, as shown in the following matrix:

**Table 5. Flow matrix among employment states in the labor market**

		Condition of working age population in t+1			Total Line
		Employed ( $O_{t+1}$ )	Unemployed ( $D_{t+1}$ )	Out of labor force ( $I_{t+1}$ )	
Condition of working age population in t	Employed ( $O_t$ )	oo	od	oi	O
	Unemployed ( $D_t$ )	do	dd	di	D
	Not in labour force ( $I_t$ )	io	id	ii	I

To better understand how the dynamics of the labor market flows behaves, it is necessary to analyze how possible is an individual change from one states to another from period to period, and not only absolute levels of flows. These probabilities can be calculated as follows:

$$P_{i,j} = \frac{F_{i,j}}{S_i} \quad i, j = O, D, I$$

Where  $F_{i,j}$  is the flow of people between the states  $i$  in the time  $t$  to the states  $j$  in the time  $t+1$ ,  $S_i$  it is the initial stock of persons in states  $i$  in the time  $t$ . Similarly, it can be built a matrix that summarizes the transition probabilities from each of the states at the time  $t$  to the other states in  $t+1$ .

This way, information provided by the matrix of flows, as well as the matrix of

probabilities, allow to have a better understanding of the labor market, and therefore, the policy measures taken can bring more effective results.

However, it should be clear that this is a methodological research, and as such, it may have some limitations as the number of persons to analyze in the information panel is not representative, in addition to the sample attrition from one period to another.

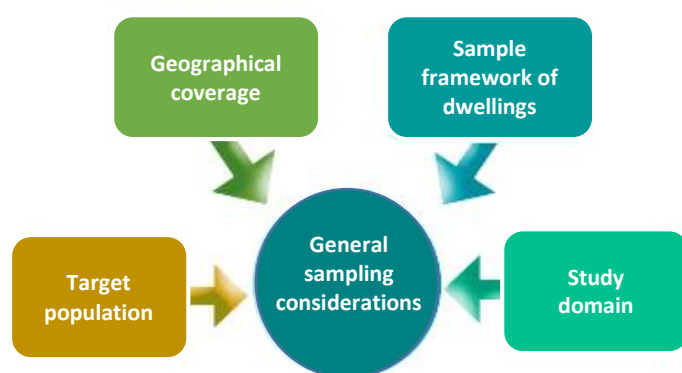
It is also important to mention that the impact at analyzing information and comparing it beyond a quarter causes loss of representativeness, since as the sample changes more quarters are incorporated, which may lead to lower data reliability due to the decreased sample size. This is why the Survey determined to perform the panel comparing only two calendar consecutive quarters.

# **V. Sampling aspects**

## Sampling aspects

The following section refers to the general aspects of ECE sample design.

**Diagram 17. General sampling considerations**



### Target population

Target population constitutes the entire population that inhabits individual dwellings, both in the urban and rural areas of Costa Rica. This definition excludes population living in collective dwellings like hospitals, prisons, hotels, nursing homes, convents, headquarters and others.

### Geographical coverage

The Survey is conducted at a national level and information is obtained according to the stratification zone, both urban and rural.

### Sample framework of individual dwellings

A sample framework of dwellings is used to select ECE sample, this is built with mapping and data of the 2000 National Population and Housing Census.

This sample framework includes the number of dwellings within each segment and variables that can be used as criteria for stratification, such as degree of urbanization, (urban – rural), as well as indicator of socio-economic level (low, medium-low, medium, medium-high, high), constituted from the visual classification of dwellings and their surroundings, which was carried out for each of the segments of the urban area and the urban periphery of the country.

Below is the amount of segments distributed by degree of urbanization:

**Table 6. Number of segments per states**

Stratum	Rural	Urban	Total
Segments	343	409	752
Dwellings	4 116	4 908	9 024

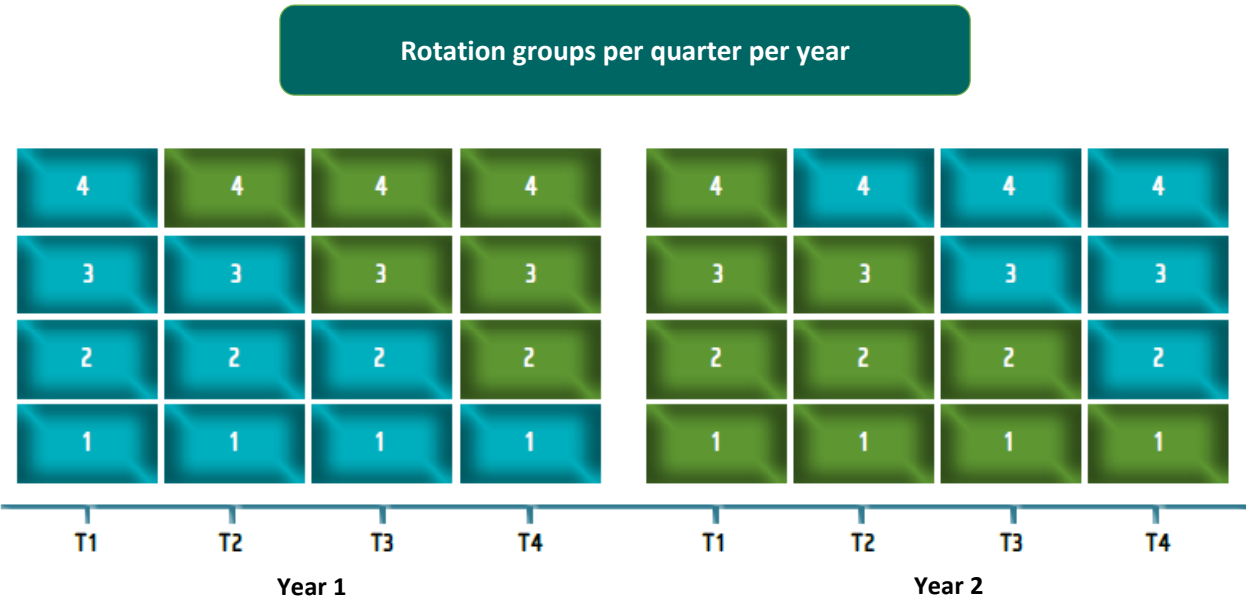
According to the table above, SPE sample consists of 9024 properties each quarter. The sample is evenly distributed along the period, that is, every month information

on approximately 3000 dwelling is collected weekly, until completing the total of dwellings from the quarterly sample.

Each quarter, the twenty-five percent rotation of dwellings is performed, and so, it is collected information on seventy-five percent of dwellings from the previous quarter, and the remaining twenty-five percent is substituted. And subsequently every quarter, so that each dwelling is visited four times a year and then excluded from the sample.

It is therefore a dwelling semi-panel which makes it easier to get better indicators on the changes observed about the labor force composition.

Diagram 18 Sampling rotation, quarterly rotation scheme of 25% of the dwelling sample for the first two years of Survey.



Quarterly sample size assigned to each zone and region was divided into four panels or independent similar size replicas. Taking into account that the Survey periodicity of the survey is quarterly, every sample replica was distributed evenly among the 13 weeks of the quarter to ensure a better representation of each region and area, and cover seasonal and circumstantial variations within regions in a balanced way.

### **Study domain (disaggregation levels)**

ECE main objective is to provide estimates by urban and rural areas for the whole country, and for some population groups, to the extent levels of accuracy permit it according to the sample size. For this reason, it is proposed to adjust by population projections at a national level to ensure consistency with estimates of population by area, sex and age groups provided by INEC. The Survey study domain is national and disaggregated by urban and rural areas.

### **Sampling updating**

Sample segments will remain indefinitely in the sample, except for specific situations when given a considerable decline in inhabited dwellings from a segment, sample completion of dwellings in any segment, very serious problems or access difficulties.

Selected dwellings will be renewed or rotated every quarter within the twenty-five percent of the sample segments, with the purpose of avoiding the interviewers'

fatigue, as well as the sample is renewed partially among quarters and totally after one year.

At the fieldwork stage, it was carried out the full tour of segments to verify the states change of dwellings (occupied, unoccupied, abandoned or under construction), and the emergence of new dwellings in order to update their selection probability in that quarter, and assign the new households high probability of being selected for the next visit.



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