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METHODOLOGY AND SELECTION CRITERIA
FOR THE SELECTION OF FARM-TO-MARKET ROADS
UNDER THE "PICO Y PALA" PROGRAM

Submitted to:

Agency for International Development
Under Contract No. PP-400-004

In partial fulfillment of the conditions precedent
for approval of the small farmer market access loan

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DESCRIPTION OF THE SYSTEM

The road selection process will be performed on three levels:

1. Preselection:
2. Selection on the basis of socioeconomic variables; and
3. Financial justification.

ANALYSIS OF THE CHOSEN VARIABLES IN THE DETERMINATION OF CRITERIA

FIRST LEVEL: PRESELECTION

Objective: The first level will attempt to select projects according to their general feasibility based on the overall characteristics of the region. The process will consider the variables listed below in terms of their inclusion in the project. Roads not meeting these criteria will automatically be dropped, as they do not fulfill the purposes and goals of the Pico y Pala program.

Physical Characteristics of the Subproject

Length of the Project: The maximum length of any subproject will be 12 kilometers, except for special cases where a margin of three additional kilometers will be allowed. This exception will be made in the event that the original road plan deviates from the final design due to unforeseen obstacles causing the length to increase.

Topography: For a subproject to be considered under the Pico y Pala program, the terrain over which the road will be built must be mountainous and/or undulating for at least 70 percent of its length. This will exclude predominantly flat lands where the costs of labor-intensive construction would be prohibitive. Additionally, areas with slopes of more than 45 degrees would be rejected. The maximum amount of earth to be moved per kilometer of road should not average more than 15,000 cubic meters.

Geological Characteristics: Only areas with at least 70 percent workable material (earth and conglomerate) will be selected. Additionally, areas with a high susceptibility to erosion or landslides will be eliminated.

Bridges and Culverts: Bridges, culverts and other necessary refinements must be less than ten meters in length. In addition, no more than a total of ten meters of culvert will be permitted per kilometer of road length.

Location: The project should not be located within areas of the National Reserve, such as national parks or archeological sites.

Socioeconomic Characteristics

Availability of Labor: To assure subproject termination, the availability of at least 50 man-months of labor per month of construction activity must be promised.

Origin of the Road Request: All requests for road construction must originate with the community to be affected.

Land Tenure: The subproject must be located within an area categorized as predominantly "minifundista" where 90 percent of landholdings are less than 20 hectares in area. Although 20 hectares is considered to be larger than what is commonly defined as "minifundio," it should be noted that priority will be given to those areas where 90 percent of the holdings are less than ten hectares.

Predominant Agricultural Activity: Areas identified as being predominantly coffee or cattle regions will be selected out. Only areas growing crops chosen in the National Food and Nutrition Plan will be selected.

Areas of Potential Agricultural Expansion: Only areas with the possibility for expanded agricultural production will be chosen.

Source of information for the above criteria: The collection of data for the preselection process will be performed by the provincial offices of the "Fondo Nacional de Caminos Vecinales." Engineers and other staff who are familiar with the region will be utilized using Form Number 1, included in the annex.

Preselcción Process

Any subproject receiving a negative or non-inclusive response to the criteria will be considered outside the range of the Pico y Pala program. Those subprojects falling within the criteria will then pass to the second level of investigation: the socioeconomic selection.

For the purposes of preselection in the first level, Form 2 (First Level Work Sheet) will be used.

SECOND LEVEL: SOCIOECONOMIC SELECTION

Objective: The second level of selection will attempt to grade the socioeconomic condition and potential of the area to be affected by the road. Eleven socioeconomic variables will be considered. Each variable has been assigned a weight according to its relative importance. This weight in turn is to be distributed between maximum and minimum parameters given for each variable. The considered variables, their justifications and parameters based on a total of 100 points are as follows:

Demography: Under this criterion, the approximate population to be benefitted will be determined. The maximum number of points assigned to this variable is six, to be divided as follows:

- More than 3 persons/hectare 6 points
- Between 1 and 3 persons/hectare 3 points
- Less than 1 person/hectare 0

Source of information: DANE, field questionnaire.

Employment: The economically active population of the area will be classified according to its level of employment and/or unemployment. The maximum number of points given to this variable is six, distributed as follows:

- Less than 50 percent employed 6 points
- Between 25 and 50 percent 3 points
- More than 25 percent 0

Source of information: DANE, field questionnaire.

Housing, Public Services and Assistance: The availability or lack of proper housing, as well as public services, are an important factor in the need for or urgency of a road project.

Housing: This criterion examines the general quality of housing, as well as the availability of water, electricity, and latrine facilities in the area. In order to define qualitatively the parameters for this section, the following divisions have been selected:

- Poor: Roof - straw
 Floor - dirt
 Walls - cardboard or mud
 Water, electricity, latrine - none
 One general room for all family activities
- Fair: Roof - zinc sheets
 Floor - cement
 Walls - wood, adobe, or zinc sheets
 Water, electricity - only water and latrine
 Separate rooms for kitchen, bedroom, and latrine
- Good: Roof - Eternit or roof tile
 Floor - wood or tile
 Walls - brick
 Water, electricity, latrine - all
 Separate rooms for kitchen, bedrooms

According to the quality of housing in the area, a total of four points will be distributed as follows:

| | |
|-------|----------|
| Poor: | 4 points |
| Fair: | 2 points |
| Good: | 0 |

Education: By calculating the ratio of teachers to students, this variable will give some idea as to the adequacy of educational facilities in a given region. Road building priority will be given to areas with the poorest ratios as follows:

| | |
|-------------------------------------|----------|
| No school | 6 points |
| Low: More than 80 students/teacher | 4 points |
| Medium: 30-80 students/teacher | 2 points |
| High: Less than 30 students/teacher | 0 |

Health: This variable examines the distance to the nearest health center in an attempt to rank the need for expanded health services. As above, road building priority will be given to areas with the poorest ratios as follows:

| | |
|--|----------|
| Poor: More than 25 km, to nearest center | 6 points |
| Fair: 10-25 km, to nearest center | 4 points |
| Good: Less than 10 km. to nearest center | 0 |

Source of information: Field questionnaire administered by the evaluation team of Pico y Pala, as per Form 4 of annex.

Area of Influence: The area of potential influence of a proposed road will be judged as a function of the length of the road, geographic features and the general transportation network existing in the region. The procedure for the determination of these factors will be the following:

- The utilization of NASA-ERTS photographic maps available from the Instituto Geografico Agustin Codazzi, combined with field interviews of residents separated by two-kilometer intervals along the proposed route.
- In the absence of maps and/or if field interviewing proves impractical, a 10-kilometer wide corridor which includes the road will be used as a proxy.

The size of the area of influence will be measured in terms of square kilometers per kilometer of proposed road. Points will be scored as follows:

| | |
|--|-----------|
| More than 16 km ² /km of road | 10 points |
| From 12-16 km ² /km of road | 8 points |
| From 8-12 km ² /km of road | 6 points |
| From 4-8 km ² /km of road | 4 points |
| Less than 4 km ² /km of road | 2 points |

Source of information: Instituto Geografico Agustin Codazzi and Field Questionnaire administered by the evaluation team of Pico y Pala according to Form 4 of the annex.

Production Potential: The production potential in the area of influence will be considered according to the following criteria:

- New lands that can be brought into cultivation, either fallow or virgin pasture.
- The agronomic potential, according to soil and climatic variables related to the practicality of growing the nine crops identified in the National Plan for Food and Nutritional Development.
- The actual yields of the area compared with national averages.

Points will be scored as follows:

- Potential for new lands as a percentage of total arable land:

| | |
|-----------------------|-----------|
| More than 20 percent | 10 points |
| Between 10-20 percent | 5 points |
| Less than 10 percent | 0 |
- Production potential: Based on average actual and potential yields of the predominant crops of the region:

| | |
|-----------------------|-----------|
| More than 80 percent | 10 points |
| Between 50-80 percent | 8 points |
| Between 30-50 percent | 6 points |
| Between 10-30 percent | 4 points |
| Less than ten percent | 2 points |
- Actual yields compared to national averages:

| | |
|---------------------------------------|----------|
| Yields less than national average | 5 points |
| Yields same as the national average | 2 points |
| Yields more than the national average | 0 |

Source of information: Instituto Geographico Agustin Codazzi, ICA, Ministry of Agriculture, IDEMA, and Field Questionnaire administered by the evaluation team of Pico y Pala according to Form 4 of the annex.

Marketing Facilities: To gain an idea of the potential demand for increased agricultural production as well as the existence of adequate storage facilities, it will be necessary to study the marketing facilities available in the region of a proposed road. This variable will be given points according to the number of kilometers from the road to marketing centers and/or storage facilities.

| | |
|--------------------------|----------|
| Good: Between 0-10 kms. | 9 points |
| Fair: Between 10-50 kms. | 5 points |
| Poor: More than 50 kms. | 0 |

Source of information: CECORA, IDEMA, Field Questionnaire administered by the evaluation team of Pico y Pala according to Form 4.

Access to Credit and Technical Assistance. This criterion will attempt to determine the existence and workings of any credit or technical assistance agencies in the region of the proposed road. If no services exist, the criterion will measure the potential for these services after the road is built. Since an increase in agricultural production is a chief goal of the project, this variable is of great importance. The weighted scores for this variable are as follows:

Access to credit: according to services provided or planned:

Good: If the subproject is within the area of influence of an office of the Caja Agraria or the FFA but does not receive services due to lack of road. 4 points

Fair: If the subproject is within an area of influence of the Caja Agraria or the FFA and does receive services. 2 points

Poor: None of the above. 0

Technical assistance: according to services provided or planned:

Good: If the subproject is within the area of influence of ICA or INCORA and does not receive services due to lack of road. 4 points

Fair: If the subproject is within an area of influence of ICA or INCORA and receives services. 2 points

Poor: None of the above. 0

Source of information: Caja Agraria, FFA, INCORA, ICA, and the field questionnaire.

Land Tenure: This criterion will be based on both size of landholding and ownership, in order to determine if the area of influence of a proposed road is latifundia or minifundia. The preferred range of landholdings will be from five to ten hectares in an attempt to give priority to mainly small farmers. Scores will be accorded in relation to landholding size as follows:

| | |
|--|-----------|
| 90 percent of holdings less than 2 has. | 0 |
| 90 percent of holdings less than 5 has. | 5 points |
| 90 percent of holdings less than 10 has. | 10 points |
| 90 percent of holdings less than 20 has. | 5 points |
| 75 percent of holdings less than 20 has. | 2 points |
| 50 percent of holdings less than 20 has. | 0 |

Source of information: Cadastral Survey and field questionnaire.

Coordination with other Governmental Programs: Priority will be given to proposed road projects that are coordinated with other governmental programs such as the Health Sector Program, the Education Sector Program, and the Rural electrification Program. Points will be awarded:

| | |
|----------------------------------|----------|
| Coordination with three programs | 3 points |
| Coordination with two programs | 2 points |
| Coordination with one program | 1 point |
| No coordination | 0 |

Source of information: Planeación Nacional, and field questionnaire.

Transportation Services: This criterion will take into consideration existing as well as potential transportation services in the area of influence of proposed subprojects. Points will be awarded on the following basis:

| | |
|--|----------|
| Good: Services already exist to the terminus of the proposed road. | 6 points |
| Fair: Services do not presently exist but would be provided if roads were built. | 3 points |
| Poor: None of the above. | 0 |

Source of information: Field questionnaire.

Conclusions to Second Level

For a proposed subproject to pass from the second level to the third, it should obtain a minimum of 60 points out of a total 100 points.

All parameters as well as their respective points will be subject to change, based on the results of field experience or the fluctuation of other factors.

A summary and a totaling of the points received by a subproject will be made on Form 3 as found in the annex.

THIRD LEVEL: FINANCIAL JUSTIFICATION

The third level of the selection of subprojects will be performed on the basis of the calculation of its internal rate of return (IRR).

- Necessary elements for calculation:
 - Actual and potential agricultural production in the area.
 - Subproject costs including maintenance.
 - Benefit/cost relationship.
- Assumptions in the calculation
 - The calculation of future production will be made according to the formula $P_f = P_o (1+i)^n$ where;

P_f = future production
 P_o = actual production
 i = average annual increase in production expected
 n = number of years necessary for production to reach its full potential (in this case we assume five years). Although all of the nine crops mentioned in the National Plan for Food and Nutrition can technologically reach potential production in one year, the capacity of acceptance by farmers is estimated to be five years.

- The increase in costs of production resulting in increased yields is estimated to be 20 percent of the value of the increased production.
- One hundred percent of the incremental production will be due to construction of the road, based on the further assumption that production would have remained the same had the road not been built.
- Production taken to market before construction of the road would have been 65 percent; following construction of the road, 100 percent of the increase in production will go to market.
- Transport costs will decrease by 75 percent as a result of the construction of the road.
- Maintenance costs for the roads will be categorized by the field engineers according to the following scale:
 - High: \$16,000 per km./yr.
 - Medium: \$12,000 per km./yr.
 - Low: \$8,000 per km./yr.
- Salvage value of the road after ten years is estimated to be 60 percent of the initial investment
- Benefits from the road will begin as soon as the road is completed (no lapse period).
- The usable life of the road will be ten years.

In order for subprojects to receive final approval for construction, the IRR must be more than 15 percent of the current opportunity cost of capital in Colombia.

ANNEX

Preselection

No. _____
Date _____

1. Departmental Office _____
2. Name of Project _____
3. Municipalities _____ Towns Benefitted _____

4. Present state of any work already begun _____

5. Length of road _____
6. Geographic characteristics of area:
 - a. Mountainous _____ percent
 - b. Undulating _____ percent
 - c. Flat _____ percent
 - d. Altitude _____ minutes
 - e. Maximum incline _____ degrees
 - f. Estimated volume of earth to be moved per km. _____
7. Geological characteristics:
 - a. earth _____ percent
 - b. Conglomerate _____ per
 - c. Rock _____ per
 - d. High propensity towards erosion: Yes _____
8. Bridges and culverts:
 - a. Culverts: Number per km. _____
Average length _____
 - b. Bridges: Approximate location _____

9. Location in reference to a National Reserve: Yes _____
10. Availability of labor in man-months _____
11. Project requested by: _____
12. Land Tenure:
 - a. Minifundio _____ percent
 - b. Latifundio _____ percent
13. Predominant agricultural activity (in order of importance):

14. Potentially exploitable agricultural areas:
 - a. Presently farmed land _____ percent of total land
 - b. Agricultural _____ percent of farmed land
 - c. Cattle _____ percent of farmed land
 - d. Land that is currently not farmed but which could be _____ percent of total land
 - e. Cattle land that could be planted to crops _____ percent of cattle land.

Form No. 1 (Continued)

15. Estimated maintenance costs per kilometer per year \$ _____
 High: \$16,000
 Medium: \$12,000
 Low: \$8,000

16. Observations: _____

Signature of Engineer _____

Signature of Supervisor _____

Form No. 2

Work Sheet First Level

Departmental Office _____

Name of Project _____

Number of Project _____ Date _____

| | <u>Yes</u> | <u>No</u> |
|--|------------|-----------|
| 1. Length kms. _____ | _____ | _____ |
| 2. Appropriate topography | _____ | _____ |
| 3. Geological characteristics | _____ | _____ |
| 4. Bridges and culverts within limits | _____ | _____ |
| 5. Location (outside of national res.) | _____ | _____ |
| 6. Availability of labor | _____ | _____ |
| 7. Requested by the community | _____ | _____ |
| 8. Minifundio | _____ | _____ |
| 9. Agricultural activity | _____ | _____ |
| 10. Potentially exploitable areas | _____ | _____ |

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Form No. 3

CODE SHEET FOR SECOND LEVEL SELECTION

No. _____

Date _____

Name of Project _____

Location: Municipality _____ Towns _____

Date of original request _____

Date of First Level Approval _____

Selection CriteriaPoints

1. Demography

Affected Population _____

Affected Hectares _____

Inhabitants/Hec. _____

More than 3 Inhabitants/Hec. 6Between 1-3 Inhabitants/Hec. 3Less than 1 Inhabitant/Hec. 0

2. Employment

Rate of Employment _____ percent

Less than 50 percent 6Between 50-75 percent 3More than 75 percent 0

3. Housing, Social Services and Assistance

a. Housing:

Poor 4Fair 2Good 0

b. Education:

No school 6

Low, more than 80 students/

teacher 4

Medium, 30-80 students/

teacher 2

High, less than 30 stu-

dents/teacher 0

c. Health:

Poor, more than 25 km. 6Fair, between 10-25 km. 1-3Good, less than 10 km. 0

Form No. 3 (Continued)

Points

4. Area of Influence

Km. of road _____
 Km.² affected _____
 KM.²/km. _____

| | |
|-------------------------------------|-----------|
| More than 16 km. ² /km. | <u>10</u> |
| Between 12-16 km. ² /km. | <u>8</u> |
| Between 8-12 km. ² /km. | <u>6</u> |
| Between 4-8 km. ² /km. | <u>4</u> |
| Less than 4 km. ² /km. | <u>2</u> |

5. Potential Agricultural Production:

a. Area

Percent area under cultivation _____
 Percent area in fallow _____
 Percent area in pasture adequate
 for crops _____
 Percent area that potentially could
 be put into production _____

| | |
|-----------------------|-----------|
| More than 20 percent | <u>10</u> |
| Between 10-20 percent | <u>5</u> |
| Less than 10 percent | <u>0</u> |

b. Production Potential: (possible increase in percent)

| | |
|----------------------|-----------|
| More than 80 percent | <u>10</u> |
| 50-80 percent | <u>8</u> |
| 20-50 percent | <u>6</u> |
| 10-20 percent | <u>4</u> |
| Less than 10 percent | <u>2</u> |

c. Level of Production:

| | |
|--------------------------------|----------|
| Less than the national average | <u>5</u> |
| Equal to the national average | <u>2</u> |
| More than the national average | <u>0</u> |

6. Marketing: (distance to market)

| | |
|------------------------|----------|
| Good, 0-10 km. | <u>9</u> |
| Fair, 10-50 km. | <u>5</u> |
| Poor, more than 50 km. | <u>0</u> |

7. Potential Access to Credit and Technical Assistance:

Credit:

| | |
|------|----------|
| Good | <u>4</u> |
| Fair | <u>2</u> |
| Poor | <u>0</u> |

Form No. 3 (Continued)

Points

Technical Assistance:

| | |
|------|----------|
| Good | <u>4</u> |
| Fair | <u>2</u> |
| Poor | <u>0</u> |

8. Land Tenure:

| <u>Range</u> | <u>No. of Parcels</u> | <u>No. of Owners</u> | <u>Percent</u> |
|----------------------------------|---------------------------|--------------------------|----------------|
| Less than 2 hectares | _____ | _____ | _____ |
| 2-5 hectares | _____ | _____ | _____ |
| 5-10 hectares | _____ | _____ | _____ |
| 10-20 hectares | _____ | _____ | _____ |
| More than 20 hectares | _____ | _____ | _____ |
| 90 percent less than 2 hectares | | <u>0</u> | |
| 90 percent less than 5 hectares | | <u>5</u> | |
| 90 percent less than 10 hectares | | <u>10</u> | |
| 90 percent less than 20 hectares | | <u>5</u> | |
| 75 percent less than 20 hectares | | <u>2</u> | |
| 50 percent less than 20 hectares | | <u>0</u> | |

9. Coordination with other Programs:

| | |
|------------|----------|
| With three | <u>3</u> |
| With two | <u>2</u> |
| With one | <u>1</u> |
| With none | <u>0</u> |

10. Transportation Services:

| | |
|---------------|----------|
| Already exist | <u>6</u> |
| Are planned | <u>3</u> |
| None planned | <u>0</u> |

11. Maintenance: (promised)

| | |
|-----|----------|
| Yes | <u>3</u> |
| No | <u>0</u> |

Total Points _____

Field Questionnaire

No. _____
Date _____

Departmental Office _____
Name of Project _____
Municipality _____ Towns Benefitted _____

1. Demography:

- a. Affected population _____
- b. Affected area _____

2. Employment:

- a. Average number of days per week spent working on own land _____
- b. Observations: _____

3. Housing, Public Services and Assistance:

- a. Housing: Poor _____
Fair _____
Good _____
- b. Education: No school _____
Poor: more than 80 students/teacher _____
Fair: between 30-80 students/teacher _____
Good: Less than 30 students/teacher _____
- c. Health: Poor: More than 25 km. to Health Center _____
Fair: Between 10-25 km. to Health Center _____
Good: Less than 10 km. to Health Center _____

4. Area of Influence:

- a. Distance people would travel to use road:
0-2 km. _____
2-4 km. _____
4-6 km. _____
6-8 km. _____
8-10 km. _____
10-12 km. _____
12 plus km. _____
- b. Geographic features that would limit the area of influence:
Rivers or gorges _____ km. from road
Mountains or hills _____ km. from road
Others _____ km. from road
- c. Other observations _____

5. Production Potential:

a. Area that could be brought into crop production: Virgin _____ %
 In fallow _____ %
 In pasture _____ %

b. Yields in the area:

| <u>Crops</u> | <u>Weight/Land Area</u> | <u>Price/Weight</u> |
|--------------|-------------------------|---------------------|
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

6. Marketing:

a. Type and distance to storage and/or consumption centers:

Type, location, Name _____ Distance _____ km.

b. Cost per ton/km. from the beginning of the road to the market center _____

c. Cost per ton/km. from the farms to the road _____

7. Access to Credit and Technical Services:

a. Credit agencies in the area: _____

b. Technical Assistance Agencies in the Area: _____

8. Municipal Cadastral Information:

| <u>Range</u> | <u>No. Parcels</u> | <u>No. Owners</u> | <u>Percent</u> |
|-----------------|--------------------|-------------------|----------------|
| Less than 2 ha. | _____ | _____ | _____ |
| 2-5 ha. | _____ | _____ | _____ |
| 5-10 ha. | _____ | _____ | _____ |
| 10-20 ha. | _____ | _____ | _____ |
| More than 20 | _____ | _____ | _____ |

9. Governmental Programs in the area (for coordination purposes):

Form No. 4 (continued)

10. Transportation Services:

- a. Existing: _____

- b. Planned: _____

11. Promise of Maintenance:

Community: Yes ___ No. ___
Municipality: Yes ___ No. ___
Department: Yes ___ No. ___
Caminos Vecinales: Yes ___ No. ___
MOP: Yes ___ No ___

Signatures of Interviewers

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