



FONDATION POUR LES ÉTUDES
ET RECHERCHES
SUR LE DÉVELOPPEMENT
INTERNATIONAL

**Read me file of the Collaborative
Smart Mapping of Mini-grid Actions
(CoSMMA)**

I - Introduction

This guide defines variables from articles within the Collaborative Smart Mapping of Mini-grids Action (CoSMMA). The CoSMMA was made possible thanks to the contribution of researchers from the University Paris 1 Panthéon-Sorbonne and the Fondation pour les Etudes et la Recherches en Développement Internationale (FERDI), namely Professor Jean-Claude Berthélemy, Victor Beguerie, Arnaud Millien, Fatoumata N Cissé, and Vincent Nossek.

CoSMMA is an information tool for the analysis and comparison of decentralized electrification projects: it collects the initial characteristics and specifications of the projects and analyses the measurable impacts they have produced.

An electrification project is qualified as "decentralized" if it meets one or both of the following conditions:

- it deploys and implements one or more redistributable production (P), transmission (T) or distribution (D) of electricity, without a regulation contract with the national grid. The precision of redistributable production leads to the exclusion of projects based on systems dedicated to local applications, i.e. whose electricity production unit has not been designed to redistribute the power generated to uses other than those for which it has been specifically designed. This excludes, for example, projects based on the marketing of solar lamps or portable SHS for captive devices (such as solar kits including a predefined number of mobile chargers, LEDs, radios and TVs).¹
- the energy delivered does not give rise to the calculation of a market price by a compensation body.

If no network or off-grid, the project is decentralized. However, a project can be both decentralized and connected to the grid if it does not provide voltage support for the setting.

CoSMMA supports an assessment project on the socio-economic benefits of decentralized electrification, based on measurable impacts and project specifications. It aims to identify the criteria that have led to the most efficient projects, i.e. those that have produced the expected impacts. It is continuously enriched by new information collected on these projects. This geographical and technical mapping tool of the installed projects should also make it easier to assess their impact on the target populations.

To date, CoSMMA has identified 403 projects distributed over 476 localities worldwide but it will eventually be fed in a collaborative way, by the project developers themselves, who will be able to identify the most promising solutions and their characteristics such as the energy source, the size of the system, the organization, and the project governance.

Based on these information, a Meta-Analysis² have been conducted, in which a detailed overview of the CoSMMA is available.

¹ Standard package of [MKOPA](#)

² See References

II - List of Variables

A. Project Identification codes

IP2 – Program id: Identification program code based on the project denomination.

Id_prog2: Numeric conversion of the IP2 identification code.

IL2 – Locality id: Identification code based on the locality, which represent the concatenation of P8b1 and P8b2.

IBUP2 – Primary Unique key of BUP – Letter: Identification code based on the concatenation of the program id code (IP2) and the locality id (P8b2).

IBUP2n – Primary Unique key of BUP – Number: Numeric conversion of the IP2 identification code.

B. Documentation Sources

D1: Nature of the article.

D2: Title of the review publishing the article.

D3: Article's authors names (research format i.e. "et. al." if several).

D4: Year of publication of the article.

D5: Exact title of the published article.

D6: Information on the Unique Common Identifier (ICU), letter code built on the first letters of the title, authors and publication date of the article.

D7: Information on the universal internet address (DOI) of the article, or the html link if it is a report.

D8: Number of citations of the article, 2 year after their publication. The goal is to identify its Impact Factor.

D10: Paper submission date to the publication review.

O1: Code Pack links the project with the reference article in the Zotero library for article classification.

C. Project characteristic and location variables

P1: Project or program name.

P2: Installed power in Watts. If information is provided by a range (ex: [2 kW – 37 kW]), the lowest is recorded.

P3: Project size (Nano to Large).

P4: Network characterization around two modalities, namely Off-Grid or Individual.

P5: No network or off-grid. A project connected to the network remains decentralized if it does not bring electrical voltage to the setting.

P6: Technology, if the article does not provide precisions the variable will be set to « existing energy mix ».

P7: geolocalization data, project's continent.

P8b1: geolocalization data, project's country.

P8b2: geolocalization data, project's locality.

P9: geolocalization data, project's latitude.

P10: geolocalization data, project's longitude.

P11: Decision level for the electrification program

P12: Implementation level for the electricity production unit.

P13: Number of people targeted by the implementation of the project. If the unit differs from household, it is specified in P13ueg.

P14: Date of PPA, PPP, PSC or any contract with principal or subcontractor formalizing the relationship between the operator and decision-maker.

P15: Commissioning date. P14 and P15 are distinguished only if these two dates are available, otherwise the same date is applied to both.

P16: Monthly price of kWh planned at the signature of the contract or at the commissioning date.

P16u: Unit of the monthly price of Kwh in euro (€) or US dollar (\$).

P17: Complete cost of the project. If known, the observed cost is registered, otherwise the programmed cost.

P17u: Monetary unit in euro (€) or in US dollar (\$).

P19: Year of closure for the industrial site. Only available for defaulting projects.

P21: Project type, factored around six modalities: Access, Default cause, Duration of access, Shutdown, Capacity, Energy substitution.

D. Expected impacts

Variables from I1 to I14 inform on the impact that the documentary resource expect to obtain through the implementation of the project. Dummy variables (“yes” or “no”) with the following impact themes:

Education, Economic Transformations, Lifestyle, Energy, Health, Housework, Allocation of Time, Leisure Activity, NICT, Gender, Security, Migration, Credit, Environment.

E. Revealed Effects and Measure Conditions

E3: Explained variable of the article (i.e. the effect measured).

E2: Dimension of effects. Aggregation of E3 variable into more usable group of effects.

E1: Group of effect. Aggregation of E3 variable to match as closely as possible with the SDGs.

E5: Type of effect factored around four modalities Direct, Indirect, Area Effect, and No Data.

E6: Existing externalities determines if the expected or measured effect of the project has influenced not connected agents.

E9: Direction of the effect on a literal form and significance level with stars.

E10: Quantification or Direction of Observed Effect inform on the magnitude of the effect in economic terms (not in coefficient) through the mention "+" or "-" if the quantification is known. For unquantified effects, the direction of the effect is indicated by the magnitude with the mention "increase" or "decrease".

E13b: Refers to the Methods of evaluation

E13g: Aggregation of E13b around four factors, Identification, Econometrics without inference, No inference OR No measurement.

E15: Characterization of effect for economic development. Label as favorable neutral or unfavorable the development effect.

M5: Name of the source database of the study. If the questionnaire was designed for the study, we indicate "original data". If a paper refers to another article in its bibliography, the "author's name" and then the "publication date" are indicated.

M6: Questionnaire type used by the article.

M7: The year or range of years covered by the statistical study data, i.e. the date of data collection. The same article can use several datasets. However, this measurement date may differ from the valuation date.

M8: Measurement level of the effect, i.e. granularity of used observations for the estimation. M8 applies to M20 and not to M9.

M9: The number and nature of observations in the sample (i.e. 300 households).

M10: Informs if data used regards rural area, urban area or both without distinction.

M11: If the conditions of the measure allow us to affirm that it is a "natural experiment" or a "quasi-natural experiment", "ex-ante feasibility" or an "other" evaluation method.

M13: "yes" if control variables are used for the measurement performed, otherwise filled in "no".

M14: "Yes" if the data used in the paper have a temporal dimension (several survey runs) as opposed to cross-sectional data.

M15: "Yes" if fixed temporal effects are used for the measurement performed.

M16: "Yes" if fixed geographical area effects are used for the measurement performed.

M17: "Yes" if fixed effects finer than "fixed zone effects" are used for the measurement performed. For example, fixed effects for households or individuals in the case of a survey where the same households/individuals are surveyed several times.

M18: "Yes" if the measurement was performed by using clusters for the calculation of the effect.

M20: Number of observations on which the measurement was made. The number of observations of the equation may differ from the number of observations of the sample.

F. Governance

G1: Clear and public role of project stakeholders. Dummy variable equals to "1" if access to information on all stakeholders' role in project is publicly available. This question is a proxy measurement of possible asymmetry of information between projects stakeholders and possible "hidden whale" in project.

G. Distribution

Q68: Type of operator contract, i.e. Power Purchase Agreement (PPA), Public Private Partnership (PPP), Public Service Contract (PSC), or other.

Q83: Q83a to Q83x are dummy variables indicating the observed appliances. Dummy variable equals to “1” if the indicated appliance is observed. Appliances list: Task lighting, Multipoint general lighting, Phone charging, Radio, Television, Computer, Printer, Fan, Air Cooler, Refrigerator, Freezer, Food processor, Water pump, Rice cooker, Washing machine, Iron, Hair dryer, Toaster, Microwave oven, Air conditioner, Space heater, Vacuum cleaner, Water cleaner, Electric cooker.

H. Assessor

N0: Date of assessment, year of evaluation. It must be between date of collected data and date of publication.

N1: Name of assessment institution that was in charge of the project evaluation.

N2: Type of assessor. Category of the institution in charge of the project evaluation

N3: Assessment Funding Source. Category of the entity funding the assessment.

N4: Publication reviewed by a project stakeholder, “1” if the publication was reviewed by a project stakeholder before release.

N5: Independence note, “1” if there is a disclaimer about absence of conflict of interest, in a recent publication, a note on independence of assessor, in an older publication.

I. Regulation

R2: Rural electrification agency, dummy variable equals to “1” if there is a public electrification agency that promotes decentralized rural electrification.

R3: Independent regulation agency, dummy variable equals to “1” if there is any independent regulatory entity.

III - Related references

Berthélemy, J-C (2019) "Challenges of decentralized electrification for economic development: lessons from experience" FERDI Policy Brief 194.

Berthélemy, J-C, and Millien, A. (2018) "*Impact of decentralized electrification projects on sustainable development: a meta-analysis*" FERDI Working Paper 240.

Berthélemy, J-C. and Nossek, V. (2018) « *L'électrification décentralisée dans l'UEMOA: leçons de l'expérience et recommandations* » FERDI Note brève B182.

Berthélemy, J-C. and Nossek, V. (2018) « *L'électrification décentralisée dans les pays membres de l'UEMOA: enjeux, bilan et perspectives* » FERDI Working Paper P230.

Berthélemy, J-C. and Millien, A. (2018) « *Pour une cartographie intelligente des projets d'électrification décentralisée* » *Liaison Energie Francophonie* n°107, 2e trimestre 2018.

Beguerie, V. and Berthélemy, J-C. (2016) "Decentralized electrification and development" Special Issue FACTS Report, Veolia Institute and FERDI.