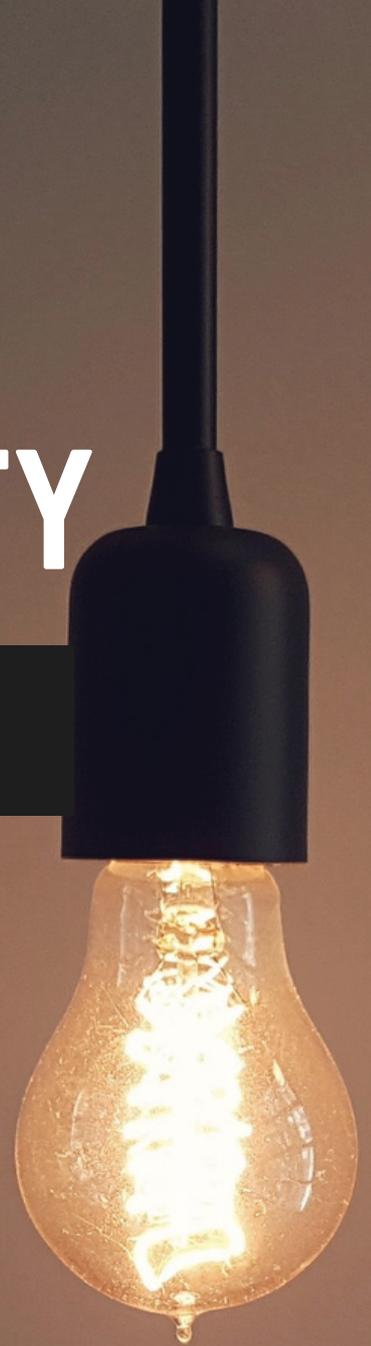


ENERGY & POVERTY

CONTRIBUTIONS TO WORD FOOD
FORUM 2021



For an Energy System that not Divides, but Adds Up

Our economical paradigm is based on infinite growth with a consequent increase in energy needs and in the cost of energy production. Besides, the relationship between economic growth and fossil fuel energy is environmentally degrading and socially unequal. The transformation of this pattern requires a transition to a low-carbon system, but not only. The transition shall not be exclusively clean, but inclusive. In addition to the poor access to electricity by an important part of the society, the energy transition means huge disinvestments in the energy sector and in fossil-fuel-based industries what can have important impacts on unemployment and inequality. Then, rethinking the energy system paradigm brings important challenges: how to transit to a carbon-neutral energy system which is inclusive?; how to deal with the social impacts of the transition on the current jobs? what a Social Green Deal looks like?

Coordination team

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Casa di Francesco and Transfer of Knowledge and Technology of Solar Generated Electricity to Poorer Communities

The Energy & Poverty Village hosts two projects that may be of interest to FAO to the 2021 World Food Forum. The first one, *Casa di Francesco*, also hosted by the Agriculture & Justice Village, is led by our senior Fr. Vilson Groh, a Brazilian Father who dedicated more than 30 years to the favelas' communities in the capital of Santa Catarina State, Florianópolis in Brazil.



Fr. Vilson Groh

The Institute Pe. Vilson Groh provides technical advice and promotes the articulation of civil society organizations in the social, educational, and financial dimensions, which focus on the defense and guarantee of the rights of the impoverished population.

The other project is idealized by our villager Junior Fabri and is called *Knowledge and Technology Transfer of Electric Energy Generation using Solar Photovoltaic Technology for Communities Without Access to Electricity*.



Junior Fabri

Junior Fabri holds a P.hD in Electrical Engineering from the State University of Campinas and developed this project as part of his P.hD.



Proposal of contributions to the World Food Forum

The Energy & Poverty Village proposes two projects that can work together due to their potential and promising effects on poor community realities, empowering the community with knowledge about sustainable agriculture cultivation, production, use of energy, cooperation, and care to our Common House. The proposal is that, with support from FAO, the Energy & Poverty Village can introduce the energy education project to the broader purpose of Casa di Francisco as this project can be allied to sustainable food production and financial empowering of communities. Using a social innovation as Non-Formal Education of off-grid photovoltaic systems, *the Knowledge and Technology Transfer of Electric Energy Generation using Solar Photovoltaic Technology for Communities Without Access to Electricity* can be introduced to Casa di Francesco as part of its aims of promoting Renewable Energy and Integral Ecology education to marginalized communities, very often, forgotten by the standard economy.

Casa di Francesco can be the organizational and training spot of the energy education project where the community can find not only the possibility of access to clean energy but to a structured place of communion and belonging. Also, Casa di Francisco is planned to be the birthplace of long-term public policies focused on territorial development.



Casa di Francesco

Abstract

Casa di Francesco is the materiality of Francis' Economy. It will be locations in which the path towards new economies can be consolidated and perpetuated. Casa di Francesco is a possibility to re-found cities. To resize the city, socio-environmental justice, the construction of the common good, refounding the city as a spot of belonging.

Objective

Respond to the echoes of the hearts of young people who live in the loneliness of the geographical and existential peripheries, responding to the cry of the earth and the families of the earth who cry out for justice. To respond to the desires of the hearts of young people in sowing, caring for, and cultivating the utopia of a world of peace and fraternity. In the urban and rural peripheries, where we find young people willing to form communities, new Galilees, where Jesus can pass by, live and transform realities.



Methodology

Casa di Francisco will be:

1) Encounter with the impoverished:

Theological spaces through which young people can experience Christ in the poor, as did Francis of Assisi. Also, a place for ecumenical and interreligious dialogue with the major religions; places for people who do not profess a religious faith but believe in economies that are born from solidarity.

2) Place of work and contemplation:

Building with the young people of the house a mystical itinerary of formation, so that this work can consolidate and commit to a life project, with the practice of justice in the common home and with the construction of the good life. Prayerful spaces open to the people of the territory, where all people are welcome and can form prayerful communities. A place to experience mysticism with open eyes, to understand humanity through a redemption practice. Defend and fight for the 3 T's: Land, Roof, and Work, so that the Casa di Francesco may be a laboratory of state public policies.

3) Place of cultivation and preservation of biodiversity:

Building a spot of care for the common house, through soil cultivation, the practice of agroecology, and opting for short-scale economies. Promoting a return to the land and the option for a simple and frugal lifestyle; learn to live with few things.

4) Place of innovation, with clean and renewable energy:

Working, through technological centers, the knowledge network, and the integration between center and periphery. Enable the youth of the territory to know, produce and improve the multiple technologies, guaranteeing participation and new means of social transformation.



Proposal of contributions to the World Food Forum

5) Place to potentialize regional development:

Through research projects within regional territories. Producing science to democratize knowledge with access to impoverished populations. Guaranteeing partnerships with Universities with similar projects as scientific knowledge is at the service of life.

6) Place to experience and deepen Pope Francis' humanism in solidarity:

Promoting the experience of the principles and values of Pope Francis' humanist proposal as the young people can be multipliers of solidarity actions for the good life and new possible, urgent, and necessary economies. A spot to live and share diverse life experiences and practices of solidarity and participatory construction for another possible world. To connect popular movements, pastoral work, ecclesial communities, and other groups that fight for peace and justice.

7) A signal of hope for youth:

Choosing hope as a life project, breaking with the globalization of indifference and betting on an alternative civilization of love.

Status of the project:

The prototype of Casa di Francesco is in development in Florianópolis, Brazil. Fr. Vilson Groh Institute has the area where the house is supposed to emerge. People willing to work on the project are being recruited and partnerships for the financing of the physical structure are still being established. Even before its physical start, the prototype has inspired new Casas di Francesco all around Brazil and some other countries.



Knowledge and Technology Transfer from Electric Energy Generation using Solar Photovoltaic technology for communities without access to electricity.

Abstract

This project aims not only to provide electricity access to communities isolated from electrification networks but, in a more all-inclusive way, training heterogeneous groups that compose these communities; conducting theoretical and practical classes, and transferring knowledge and technology to the inhabitants.

Objective

The objective is to instruct heterogeneous groups (in terms of age, culture, level of education, etc.), residents of communities without access to electricity networks. The train aims to develop competencies in installing, performing preventive and corrective maintenance, and designing solar photovoltaic systems. Furthermore, given the community the knowledge to deal with their electric network, the project promotes cleaner energy in poor territories and financially empowers neighborhoods with fewer job opportunities.



Enabling the long-term success of the project requires providing training for the residents of these communities. Several researchers have pointed out that projects of electric energy access projects using sustainable technologies- such as photovoltaic or wind energy- have a high failure rate mainly due to the lack of trained agents in the communities capable of maintaining the functioning structure. The project proposes to tackle this problem by equipping these communities with knowledge transferring and technology assets.

Methodology

To carry out the project, the reality of each community was explored, thus developing technical content to each region, availability of technologic assets or needs.

For this development, we used the concepts of Non-Formal Education, which allows a more human approach, closer to the community and its agents, building together (community and educators) the training taking into account the real needs and interests of the residents of this community.

Man cannot actively participate in history, in society, in the transformation of reality if he is not helped to become aware of reality and of his own capacity to transform [...] No one fights against forces he does not understand, whose importance he does not measure, whose outline forms he does not discern; [...] This is true if, it refers to social forces[...] Reality cannot be modified except when the man discovers that it is modifiable and that he can do so."

PAULO FREIRE



Below, some stages of the proposed project:

1) Introduction to Electricity and Electronics

In this stage, the participants are submitted to theoretical and practical classes through a technical approach in a language based on the experiences of the residents of these communities. In this step, in addition to the theoretical concepts of electricity and electronics, we also covered types of energy sources, energy transformation, concepts of renewable energy, etc.

Example 1:

How to talk to a heterogeneous group about the functionality of a simple battery? (for us, simple battery). In this case, we physically present a battery, disassembled and open, so that the students can hold it in their hands, create curiosity and hold everyone's attention. Then, we devise practical and safe experiments, using electricity and electronics kits, in this way, the residents can "visualize" the transformation of energy, which by going through a chemical reaction turns into electrical energy.

After all presentations, it is exemplified that a battery behaves like the soil for cultivation, a reality they usually are familiar of. The soil needs energy, and for this, it needs to be fertilized (charge its energy) for the plants to grow. A soil without care, without fertilizing, is like a discharged battery, that is why the care with the battery is so important.



Fig 2. Experimenting with electricity and electronics, as well as energy transformations.

2) Introduction to photovoltaics:

In this step, the participants get to know the components that make up a photovoltaic system in the off-grid modality. They also build models and simulations of solar photovoltaic and wind power generation systems using a teaching kit.

After understanding the entire operation of a solar or wind power generating system, the residents assemble systems with real components from an energy generating system and are also assisted to make charge calculations, which is nothing more than calculating the amount of energy needed based on the number of appliances they want to turn on in their homes.

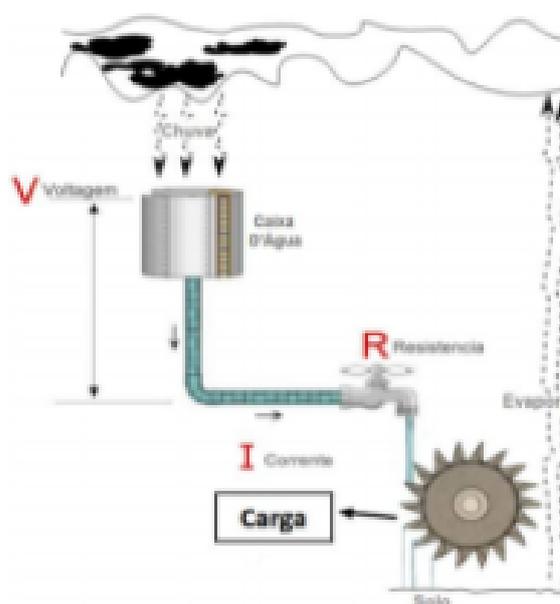


Fig 2. Example of a simple hydraulic system, so that participants can understand, through something real, the physical elements that make up an electrical system.

3) Assembling photovoltaic solar panels:

In this stage, the participants assemble/create from scratch a photovoltaic solar panel. This is necessary as they can have total access to how this technology works;



Fig 3. Presentation and explanation of all the components that are necessary for the construction or assembly of a solar photovoltaic/wind off-grid system.

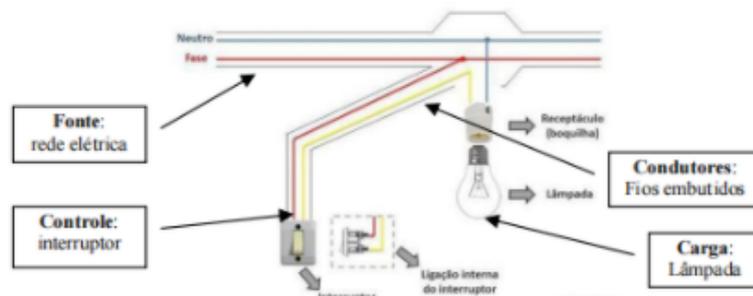


Fig 4. simple one-lamp system to exemplify what a residential electrical system is, thus illustrating what a charge is (electrical energy consumption).

Proposal of contributions to the World Food Forum



Fig 5. An experiment of assembling and simulating a photovoltaic system for understanding the whole system, the X, Y, X movements and axes, geographic coordinates, etc.



Fig 6. Practical classes on soldering photovoltaic cells and assembling strings of photovoltaic cells with the series connection.

4) Installing a photovoltaic system and configuring its components:

In this step, the participants install the panels and components in their homes. In this way, one family assists in the installation and configuration of the other families.



Fig. 7 Attaching the photovoltaic cell strings, testing the cell and string welds, power generation tests, and finalizing the solar panels.



Fig 8. Installation and configuration of solar photovoltaic systems in the community.

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