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# A Dialogic and Ecosystemic Agricultural Praxis at the National University of Costa Rica

## UNA praxis agrícola, dialógica y ecosistémica

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**Abstract:** In Costa Rica, vegetable production has intensified in recent decades due to the use of technological packages (synthetic fertilizers and pesticides) in monocultures. This model has sustained production in Zarcero, Costa Rica, a canton that supplies vegetable products to the Central Valley region. However, studies conducted by the Regional Institute for Research on Hazardous Substances (*Instituto Regional de Estudios en Sustancias Tóxicas*, IRET) have revealed worrying results on the use of pesticides and their harmful effects on the environment and people's health. In response to this problem, IRET, the School of Agricultural Sciences, and the Rural Education Division launched a project in 2018. This project aimed "to promote an alternative model in agricultural production through collaborative work, dialog between different types of knowledge, and social construction of knowledge to reduce the use of agrochemicals in Zarcero, Alajuela, Costa Rica."

The project has developed activities with 1) national and international academic teams, 2) farmers and their families, and 3) school children. The first stage of the project was the formation of a team where its members develop the following: a) a common theoretical-political frame of reference, b) an interdisciplinary view to analyze, work on, and transform reality, and c) an affective fabric to promote understanding and from there to work on goals jointly. To achieve this, we have conducted a) study circles, b) fieldwork, c) exchange of knowledge at the national and international level, d) modular agricultural education production, and e) articulation with teaching, research, and production. In addition, agroecology has been positioned in institutional, local, regional, and national political agendas and in some international territories of the continent.

From the academic work intertwined into the project, we have learned to be and to make a "necessary university" since universities need to be legitimized in the country, so it has been proposed in order to regain the trust of farmers and their families, to create spaces of rapprochement to jointly contextualize and reflect on agricultural issues, revitalize different types of local knowledge and obtain inputs for producing educational documents with a socio-critical approach from popular education.

**Keywords:** education, participatory approach, socio-critical approach, pesticides, agricultural practices

**Resumen.** En Costa Rica, la producción de hortalizas se ha intensificado en las últimas décadas por el uso de paquetes tecnológicos (fertilizantes y plaguicidas sintéticos) en monocultivos. Este modelo ha sostenido la producción en Zarcero, cantón que provee productos vegetales al Valle Central. Sin embargo, estudios realizados por el Instituto Regional de Estudios en Sustancias Tóxicas (IRET) han revelado resultados preocupantes sobre el uso de plaguicidas y sus efectos negativos en el ambiente y en

la salud de las personas. Como respuesta a esta problemática se inició en el 2018 un proyecto con la participación del IRET, de la Escuela de Ciencias Agrarias y de la División de Educación Rural, cuyo objetivo es “promover un modelo alternativo en la producción agrícola mediante trabajo colaborativo, diálogo de saberes y la construcción social del conocimiento para disminuir el uso de agroquímicos en Zarcero, Alajuela”. En el proyecto se han desarrollado actividades con 1) equipo académico nacional e internacional, 2) personas agricultoras y sus familias, 3) escolares. El primer paso del proyecto ha consistido en la conformación de un equipo donde sus integrantes desarrollen: a) un marco teórico-político de referencia común, b) una mirada interdisciplinaria para analizar-trabajar-transformar la realidad y c) un tejido afectivo para favorecer entendimientos y desde ahí mancomunar metas. Para lograrlo, se han realizado: a) círculos de estudio, b) trabajo de campo, c) intercambio de saberes en el ámbito nacional e internacional, d) producción educativa agrícola modular y e) la articulación con la docencia, la investigación y la producción. Además, se ha posicionado la agroecología en las agendas políticas institucional, local, regional y nacional y en algunos territorios internacionales del continente.

Desde el trabajo académico tejido en el proyecto se ha aprendido a ser y a hacer “universidad necesaria”, ya que las universidades requieren legitimarse en el país, por lo que se ha propuesto, para recuperar la confianza de las personas agricultoras y sus familias, gestar espacios de acercamiento para contextualizar conjuntamente y reflexionar sobre la problemática agrícola, revitalizar saberes locales y obtener insumos para la escritura de documentos educativos con enfoque sociocrítico desde la educación popular.

**Palabras clave:** educación, enfoque participativo, enfoque sociocrítico, plaguicidas, prácticas agrícolas

## Introduction

In Costa Rica (and worldwide), vegetable production has intensified in recent decades due to the widespread use of technological packages that promote the establishment of monocultures, the use of fertilizers to provide nutritional requirements to plants, and pesticides to control populations of unwanted organisms.

This model has been consolidated in Pacayas (Cartago) and Zarcero (Alajuela), Costa Rica. Both cantons are suppliers of fresh vegetable products for consumers in the Central Valley and other regions of the country. However, the consequences of the current agricultural model have been questioned for several years due to the growing negative effects on soil, water, and biodiversity, damage to the health of workers and growers, their families, communities, and, in general, the entire environment and the cultural environment.

Studies by the Regional Institute for Research on Hazardous Substances (Instituto Regional de Estudios en Sustancias Tóxicas, IRET) showed worrying situations regarding the use of fertilizers and pesticides in Pacayas in 2009 and Zarcero in 2016. In the latter canton, the studies revealed that the four most widely used chemical substances are *highly hazardous pesticides* (HHPs), which are characterized by being included in international environmental conventions (PAN, 2016) and having one or more of the following attributes: highly acute toxicity, high chronic toxicity, high environmental toxicity (toxic to fish, bees, or other organisms).

These pesticides are used at high doses, even beyond the manufacturer's recommendations (e.g., chlorothalonil-based pesticides are used at an average dose of 5.9 kg a.i./ha/cycle, mancozeb-based pesticides are used at an average dose of 5.2 kg a.i./ha/cycle) and are used by a large number of farmers (e.g., chlorothalonil is used by 78.8% of the surveyed farmers, while cypermethrin is used by 61% of the surveyed farmers). Some of the HHPs were detected in varying concentrations in soil (e.g., chlorothalonil, chlorpyrifos, and flutolanil), where they can be very persistent (DDT was detected in soil on one farm), in water bodies such as springs, rivers, and, even, in drinking water storage tanks belonging to Administrative Associations of Rural Water Service. In these places, minimal concentrations of chlorothalonil and prothiophos were detected, and minimal concentrations (for example, chlorothalonil, chlorpyrifos, and cypermethrin in vegetables were found in compliance with the Costa Rican standard (SFE, 2016). However, this does not guarantee consumers' health safety.

In Zarcero, the amount of pesticides used in agriculture is inappropriate, as well as the management practices; for example, only 30% of the farmers monitor unwanted organisms to apply pesticides. Instead, they use pesticides preventively, even though crops do not show signs or symptoms of diseases.

A critical practice to using the right amount of pesticides is the calibration of the application, and only 25% of farmers report doing this. Consequently, it is possible that pesticides are being applied in excess, releasing more of these substances into the environment than required. In conclusion, the entire community of Zarcero is being exposed to hazardous substances consistently, which puts the ecosystemic life of the area at serious risk. A similar situation persists in Pacayas.

In accordance with the institutional normative framework of the National University (UNA), its Organic Statute states the principles of a) **Humanism**: "The UNA promotes justice, the common good, unrestricted respect for

human dignity and human rights” and **nature rights**; and b) **Environmental responsibility**: “Through the different forms of its substantive work, the university promotes the protection and defense of ecosystems to ensure their conservation for future generations” (Organic Statute of the National University, 2015, p. 19). In 2018, a project was launched to respond to the problems detected in Zarcero.

Academic staff from three departments have participated in this project: IRET, the School of Agricultural Sciences (ECA), and the Rural Education Division (DER), as well as students from the agricultural, biological, and environmental areas, who have contributed to the achievement of the following objective: “Promote an alternative model in agricultural production through collaborative work, dialog between different types of knowledge, and social construction of knowledge to reduce the use of agrochemicals in Zarcero, Alajuela.”

The problem of the inappropriate use of agrochemicals in agriculture is not limited to the work of farmers since it is highly influenced by trends and demands of the national and international market and interests linked to the capital on the part of transnational corporations and is, therefore, a complex situation that is difficult to counteract. This has been expressed by government institutions, public universities, non-governmental organizations, and civil society organizations, which have made significant efforts to educate and raise awareness on the proper use and management of agrochemicals; however, it is recurrent to hear that the positive results are scarce.

Due to the above, we concluded that, to fulfill our project’s objective, it was critical to address the problem from an interdisciplinary approach and not exclusively from the agricultural sciences, having critical thinking as a transversal axis. Therefore, in addition to specialists in Agricultural Sciences, it was necessary to incorporate participants from Rural Education, Occupational Health, and Anthropology.

Currently, our work team consists of nine UNA academic staff and ten students who have collaborated for limited periods or on a more constant basis. The students have participated in the project by serving supervised professional internships as assistants, and four of them are currently working on their final graduation projects.

It is essential to mention that the project, in addition to having an extension component (with farmers and the educational community), also includes research activities (in clean technologies: biobeds, bioremediation, biogardens),

teaching (workshops with undergraduate and graduate students), and production (teaching materials for schoolchildren and educational modules for farmers).

In addition, agroecology was incorporated into the redesign of the curriculum for educators working in rural contexts in various regions of the country.

## Methodology

The project's methodology is participatory and based on a socio-critical approach (Santaella, 2014) that starts from problematizing reality; it also tries to forge alternative referents to reflect and transform community agricultural practices. In general terms, the methodology has been built over two years and six months and has been developed on three levels. However, these are not mutually exclusive; on the contrary, they overlap and feed on each other. The work levels are the following: 1) academic team and students, 2) farmers, their families, and communities, and 3) educational community and local government.

The details of the methodologies will be described below.

### Working With Academic Staff and Students

The project's first objective was "to form a multidisciplinary group of teachers prepared for the development of participatory, non-formal educational processes aimed at agricultural producers." This arises as an answer to the question: Does UNA academic staff, oriented by critical thinking, have the skills to form interdisciplinary teams and conduct extension projects in communities?

Based on this, the first activities aimed to develop a common theoretical and political framework of reference, an interdisciplinary approach to analyze and work on reality, and an affective fabric to promote understanding among group members. To try to achieve the above, the *study circle* methodology was implemented.

This activity has been conducted biweekly since the start of the project in January 2018 to date and is planned to continue throughout 2021. In 2018, during the study circles, members of the academic team (academics and students) prepared and presented topics of interest, recommended readings or teledocuments for independent reading, or suggested the intervention of invited persons; the subjects should be linked to the work of the project. Regardless of the modality, a discussion and analysis of the topics were developed during each session.

Some examples of topics discussed during the study circles were the socio-political foundation of the necessary university, the presentation of the main results obtained in the project *Good Agricultural Practices in the Use and Management of Agrochemicals in the Horticultural Area of Zarcero, Alajuela*, carried out between 2014 and 2016, educational experiences with producers, participatory methodologies, occupational health, crop diseases, soil ecology, biological control, critical look at the capitalist-extractivist system, the organization and social participation in local life, among others.

In 2019, the study circles focused on generating academic thinking to favor the production of educational materials that will serve as support material for working with farmers in the later stages of the project. The above was to meet this objective: “To design a continuing education module for agricultural producers on the use and management of pesticides for its implementation in Zarcero, Alajuela.” To date, sixty study circles have been held.

The fieldwork methodology has been implemented throughout the project life cycle in Zarcero. Visits are organized on a biweekly basis and attended by both academic staff and students. However, since March 2020, due to the pandemic, the fieldwork required adjustments in the schedule to support the commercialization of some crops of farming families with whom we have worked articulating research and extension. The frequency of the visits had to be reduced because of the impossibility of having the necessary transportation at the institutional level due to sanitary restrictions, but thanks to the team’s willingness, visits have been organized to accompany in times of uncertainty, crisis, and fear.

Visits have also been organized to Los Santos, Heredia, and, internationally, to Bolivia in 2018 and Colombia in 2019. The objectives of the field trips have been different at different stages of the project. In the first stage, in 2018, the visits aimed to introduce ourselves as a working team to the farmers, inform them about the results of the previous project (conducted between 2014 and 2016), and invite them to participate in the new project.

During this first stage, we found that the UNA and universities, in general, are delegitimized in Zarcero; this has been a challenge for the team, as they have had to work to regain the farmers’ trust in the academic work processes generated by higher education. For this purpose, we visited the farms, where we spent some time working on agricultural activities farmers carried out during the visit (fertilizing, harvesting).

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This simple task succeeded in opening up spaces of rapprochement to jointly contextualize and reflect on agricultural issues, revitalize local knowledge and learn about the problems and satisfactions of the activity, concerns, uncertainties, and disappointments derived from agricultural work. So far, we have made 50 trips to Zarcero.

In 2019, in the third fieldwork stage, we focused on collecting material to construct the educational module, which is being designed in co-authorship with the farmers of Zarcero. This module collects and presents technical information, local knowledge, opinions, thoughts, and feelings of the people visited during the trips. The educational module covers ten general topics, some examples of which are soil knowledge and protection, alternative production systems, problems and threats to agriculture, an integrated approach to occupational health and safety in agriculture, phytosanitary management of horticultural crops, family farming, and the proper use and management of pesticides.

Another important activity carried out during 2018 and 2019 has been the presentation of information on the project's work in various forums and before different audiences at the institutional, local, regional, national, and international levels as an academic action to create spaces in the political-decisional agendas in various scenarios.

In addition, the project has strategically incorporated students from different careers of the UNA into the activities. The students accompanying us study Environmental Management Engineering, Agronomy Engineering, and Biology. Also, the topics of the courses developed at the undergraduate and graduate levels have been enriched with literature, e-documents, and field experiences that contribute to a healthy debate on the conditions under which rural agricultural production should be developed to promote healthy communities.

### **Working With Farmers, Their Families, the Community, and Local Government**

In addition to working with farmers during field trips, we have organized several activities from a farmer-family-community approach. This is based on the premise that family members (partners, sons, and daughters), although in many cases they do not participate directly in the decisions made at the farms, do indirectly influence their operation. For example, couples (especially women), sons, and daughters are promoting force for change.





Examples of these activities are: 1) A trip with families participating in the project to the Don Juan Educational Farm, where ecological agriculture, family farming, and various educational processes for the care of Mother Earth are promoted. 2) Two intercantonal meetings between Zarcero-Los Santos communities and Buenos Aires de Puntarenas-Zarcero locations, where families from both cantons visited the ecological farm Tierra de Sueños (Land of Dreams) in Zarcero to learn more about the principles of agroecology and discuss the issue of generational change in agriculture. It was a space that politicized (in a good way) the topic by demanding local governance from alternative agricultural experiences.

During the stage of the project, some activities will be carried out based on the farmer-family-community approach in order to co-design (to present), put into practice, provide feedback, and validate the educational material that is being finalized.

It is important to mention that one of the project's initiatives was to present a proposal to change the *UNA's contracting regulations* to incorporate the figure of a "person with local, ancestral, or experiential knowledge." The above is in response to the fact that the academic work developed from a participatory approach in the project has allowed understanding, recognizing, and valuing of alternative epistemologies anchored to the daily life of families and communities, so it is proposed to incorporate people with local knowledge to share and deconstruct spaces of university life.

From the project, we recognize that the national and continental society demands an intelligent, thinking, reflective public university empowered to build and deconstruct its culture from a learning dialog based on communities' needs. This implies strengthening the necessary university to demonstrate to the country that the UNA is capable of forging a work where knowledge generated in university research meets the knowledge treasured in the daily practice of the life of farming families and communities.

It is relevant to consider that, in the contemporary university space, an epistemic social, political, economic-environmental crisis is unveiled, where it is demanded to study the academic aspect to build an intra-university critical approach, which makes it possible to rethink, with responsibility and commitment, the pillars upon which the way of "doing university" has traditionally been based (Letter to the University Community, 2018).

From the deconstructed academic work, we can express that it is necessary to incorporate people with local knowledge into the academic life of the UNA to enrich and revitalize the work demanded in teaching, research, extension, and production from the necessary university. As academic bodies, our duty is to build the UNA as a sensitive, versatile, intelligent, coherent, and faithful organization committed to improving the lives of communities. Therefore, we need a higher education institution capable of designing alternative training processes, where dialog processes are forged to encourage unlearning experiences to set free from a colonizing episteme, which makes invisible knowledge built by peoples and persons not involved in academic work.

The substantive areas assumed from the necessary university have the mission of forging a social, inclusive, just, and solidarity-based imaginary, where it is possible to weave an alternative sense of life, linked to the achievement of fighting, resilient, emancipated, cultivating communities, eager to fight against agri-food dependencies.

National and international society demands higher education institutions willing to share spaces for learning dialog experiences, from decolonized visions and committed actions.

Dietz, cited by Casado *et al.* (2015), expressed that

The University of the future cannot be a container of knowledge but an instance for the dialog between different types of knowledge in the face of the pretended monopoly of knowledge by an institution postulating itself as the key to the transformation of any instance except itself. (p. 26)

Therefore, in order to gain legitimacy at the intra-university level, it is essential to achieve coherence between what is said and what is done. In this case, it is necessary to understand that knowledge is created and recreated in permanent dialog with the people who shape life and can solve their problems with the knowledge naturally acquired in their daily life experiences.

To accomplish the above, it is important to create spaces for reflection that allow the intersubjective encounter of people inside and outside the academy to come up with alternatives to facilitate changes and transformations for achieving a better country. This will help train people who will be responsible for contributing to the reconstruction of a society where serious problems are reflected in different areas: social, economic, political, environmental, and, most importantly, ethical.

Modern society requires new paths in university education; it is impossible to expect substantive changes in society if institutions are not transformed and, particularly, the way university life processes are developed.

From a practical point of view, there are people at the local level with significant knowledge to enhance academic life and the processes of university life, as well as community life. Therefore, alternative academic management makes it possible to legitimize knowledge built by people in the community based on their daily life experiences and the articulation of this learning with the theoretical background. This is also fundamental in bridging the gap between university and society, providing evidence of a respectful, dialogic and engaged approach to local, national and international life.

### **Working With the La Brisa School Educational Community**

Historically, the rural school has had an educating force through the coordination of its work with families and the community. For this reason, the project considered *political and pedagogical work* to revitalize the idea of caring for, respecting and protecting Mother Earth and, in particular, transforming agricultural crop practices in the canton of Zarcerro as a reference to other regions of the country and the continent.

Academic work required the design of study circles with the school's teaching staff to forge a socio-critical view of the role of the school regarding the problems of local life, particularly concerning farming practices in the community.

Based on the teachers and children's contributions, several educational spaces were designed that allowed us to reflect on the idea of a *walking school*; this is how it was possible to travel to other national and international territories to share experiences and exchange ideas that revitalize the life of the school and bring about positive changes in the life of the community.

Given the encouraging framework provided by *critical pedagogy*, it was possible to transform the approach to school annual events in order to reposition on the school agenda the political-educational debate aimed at favoring an alternative meaning of life, where it is possible to understand and value the relationality, interdependence, reciprocity, and complementarity that are the bases of life on Mother Earth.

Thanks to educational work in the School, it was possible to live a pedagogical experience that blurred the school boundary. Also, it provided the opportunity to write and live a methodological path to encourage educational processes in

rural schools and to produce a document that records the pedagogical work achieved with the educational community that ventured to design pedagogical alternatives linked to a healthy, responsible, sustainable and productive life.

The children's voices provided a valuable space for reflection and social action on the issue of protecting human and environmental health, given the legitimacy of their thinking in schools, families, communities, and universities.

This educational material was shared in sister towns on the continent thanks to the coordination with graduates of the Master's in Rural Education in Central America of the UNA and the international tour to Colombia in 2019.

### **Results Linked to the Construction of the Extension Policy**

From the extension work, we have carried out in the framework of the project, we consider that the critical elements to be taken into account in order to perform the extension from the necessary university are the following:

#### **Considering the Foundational Purposes of the UNA**

The extension work of universities, and especially the work done by the UNA as a necessary university, must be based on the foundational institutional purposes; in other words, we must be clear in answering the question: What is the purpose of extension from the UNA? To respond to the above, it is necessary to be familiar with and include the principles, values, and goals contained in the Organic Statute in the extension projects.

This aspect may seem obvious, but the reality is that most academics are unaware of it. The study circles and interdisciplinary fieldwork conducted in our project have allowed us to understand what, how, why, and for what purpose extension is done in order to achieve a robust social justice society. In other words, working on the project has allowed us to understand how we must build academic life to develop the Necessary University. Some of our project's principles, values, and institutional goals are environmental responsibility, the dialog between different types of knowledge, interdisciplinarity, and critical thinking.

#### **Including the Socio-Critical Approach**

Academic work in the UNA should be built from the socio-critical approach, which seeks to problematize reality in order to raise social awareness and propose to transform reality for the good of vulnerable populations, through

a rigorous, questioning, but hopeful approach, which preponderates the problems that emerge from everyday life, which implies the participation of social actors, and favors the breaking down of the disciplinary boundary, so deeply rooted in the academy. As a result, it promotes a two-way dialogic praxis based on interdisciplinarity and dialog of knowledge.

The socio-critical approach in extension requires a close bond with reality, which enriches and stimulates the substantial action of the university; however, it is a great challenge since academics are often reluctant to step out of their campus and discipline. Finally, the socio-critical approach promotes epistemic curiosity, the studious, creative, emancipated spirit that gives meaning and strength to the necessary university.

In the project, we put the socio-critical approach into practice during the fieldwork, with good results. The interdisciplinary group proposes reflective exercises based on the theory that encourages dialog with farmers, and together, they contextualize some problems related to inadequate agricultural practices carried out on their farms. This exercise has succeeded in “sowing” the idea of change in some farmers and has created spaces for local and intercantonal exchange. In addition, material and information have been collected for the construction of educational material co-authored by the farmers of Zarcero.

### Articulating Substantive Areas

University extension developed from the socio-critical approach provides elements to feed and articulate teaching, research, and academic production. Some activities that exemplify the articulation of the substantive areas of the UNA on the axis of extension are:

- A) Incorporation of students** in the project activities in the modalities of supervised professional practice, course work, final graduation projects, and student assistantships. So far, the students have developed
- two supervised internships: i) *Analysis of Management of Empty Agrochemical Containers in Zarcero* by Kimberly Mejía Alvarado, in collaboration with the Environmental Management Office of Zarcero, and ii) *Evaluation of degradation potential in biobeds inoculated with chlorothalonil decomposing microorganisms in the Santa Lucía experimental farm*, by Mary Paz Jiménez Domínguez.
  - A paper titled *Characterization of Bacterial Strains With Pesticide Degradation Capacity, Isolated From Agricultural Soils in Zarcero, Alajuela*, as a research project for the applied Biotechnology

course by students Joyce Estrada Gamboa, Johanna Ramírez Ruíz, Violeta Oliva Mercado and Stephanny Sánchez Vargas. c) Two final graduation papers, which are in process: (i) *Strategy for the proper disposal of pesticide waste generated by small and medium horticultural producers in the canton of Zarceró, 2019-2020*, by Mary Paz Jiménez Domínguez; and (ii) *Proposal for the design of a built wetland for the treatment of wastewater from a vegetable packing farm in Zarceró*, by Érika Montero Angulo. Additionally, two final graduation papers started in 2020: (i) *Bioremediation of Soils Contaminated With Pesticides as a Collaboration With a Good Agricultural Practices Project of the Instituto Regional de Estudios en Sustancias Tóxicas (IRET, Regional Institute for the Study of Toxic Substances), Zarceró, 2020*, by César Jiménez Vargas; and (ii) *Evaluation of a soil bioremediation strategy in horticultural farms in Zarceró, Alajuela*, by José Francisco Sibaja Arce. Finally, we have two student assistants: Joyce Estrada Gamboa and Jorge Berrocal Alfaro, who support the project's research and extension activities.

- B) Elective course** offered to students of the Rural Education Division. The academic project designed the elective course Ecology and Ethics of Care, which provides knowledge to feedback-enrich-transform the redesign of the Bachelor's Degree in I and II Cycles with Emphasis in Rural Education. This curriculum proposal for the training of educators working in rural and indigenous areas provides a space for citizen training with a critical view to analyze global macroeconomic trends inspired by monoculture production and the impact of this process on the deterritorialization of rural communities. In the study plan, the course is described as “an educational-ethical-productive experience to build a critical look and action around contemporary productive trends, in order to forge an alternative rural life from where it is possible to understand and extend the principles of relationality, reciprocity, interdependence, and complementarity on which life on Mother Earth is based. This course is an educational space that helps to forge socio-community awareness, which stimulates food sovereignty, food production in harmony with the environment, conservation and multiplication of native seeds, and autonomy in the production of healthy food for the family, the community, the canton, the province, and the country. This curricular proposal is expected to generate formal educational spaces that favor the experience of educational processes with meaning and significance for the rural life of the communities.

**C) Educational module**, specifically the material built by children and educators of La Brisa School, arises from critical pedagogy and the commitment to improve the community's life based on the proactive thinking that emerges from the school as a political project committed to community life. The learning dialog anchored in the problematization of local productive life, fed by the proactive pedagogical work of a walking school, allowed the design of a methodological path that favored the production of educational materials revealing the pedagogical experiences of the educational community where the bond between school, family and community is strengthened. This material will be offered as a gift in 2021 to the farmers of the area and the local government to express the appreciation of agricultural work and to demonstrate the accompanying role of the rural school in establishing sustainable agricultural production.

### **Interdisciplinary Work and Dialog of Knowledge**

As mentioned above, the issues emerging from the socio-critical approach during extension activities should be addressed from interdisciplinarity and dialog of knowledge. Thanks to these elements, it was possible to bring together farming families, university students, community authorities, the school, the family, and the community of Zarcero to reflect on environmental problems in the community, such as the intensive use of pesticides, water pollution problems, health problems, and others, in order to propose solutions from an ecosystemic approach.

Some examples of activities that have been carried out for this purpose have been: (a) the visit of the Municipal Council and the community of Buenos Aires de Puntarenas to the organic farm Tierra de Sueños in Zarcero to learn about ecological agricultural practices, (b) the visit of farmers from Zarcero to the Don Juan Educational Farm to learn about an integral ecological project in La Fortuna de San Carlos, c) academic work with international guests who contributed to the debate and the definition of methodological paths, d) in addition, problems of a social nature and national importance have been addressed, such as a generational change in agriculture, a topic that was discussed during the Zarcero-Los Santos Intercantonal Gathering.

### **Socialization at the National and International Level**

It is critical that the information and knowledge generated in the universities are made known at the institutional and community levels, as well as at the

national and international levels, through outreach activities. These activities are important because they are a way of legitimizing the work of higher education institutions.

Some examples of dissemination activities that have been carried out within the framework of the project are presentations at the Council of Vice-Rectors of the UNA and the Curricular Commission of the Center for Research and Teaching in Education (*Centro de Investigación y Docencia en Educación, CIDE*), talks to students requested by professors of various courses of the Schools of Biology and Agricultural Sciences, and a working day with students of the Master's Program in Central American Rural Education (*Maestría en Educación Rural Centroamericana, MERC*), activities during the visit of intern professor Omar Felipe Giraldo Palacio, from the Colegio de la Frontera Sur (Mexico), presentations at the Municipal Council and the Local Sector Committee of Zarcero, at the Meeting of School Principals of the San Ramón region, before officials of the State Phytosanitary Service, coordination with a local television station, among others.

## Discussion and Conclusions

The university academic process developed in the project involving three units of two faculties (Earth and Marine Sciences and the Center for Research and Teaching in Education) has enriched the participatory approach to problematize the global-national-local reality. This has favored the construction of a critical view of the socio-political-economic and productive system through the creation of interdisciplinary academic teams that transcend the disciplinary view to understand, explain, analyze and contribute to the improvement of life in reality. This allows an awakening of consciousness to discover the urgency of forging an alternative sense of life in the family-community-society, inspired by the principles that govern life on Mother Earth: relationality, interdependence, reciprocity, and complementarity.

During the project activities, we tried to go deeper into the study of the interrelation of experiential knowledge and how it is linked to alternative theoretical-conceptual referents, which allowed us to give meaning and political significance to the necessary university, both nationally and internationally. In addition, the methodological path forged in the project reveals a relevant finding to decolonize academic life in the UNA, for example, through the feeling, thinking, and doing of the children's community, which legitimizes, together with the community, a process of change in the way of cultivating and establishing relationships with Mother Earth.





Throughout two and a half years, our conception of the project work has evolved. It has changed substantially compared to the initial plan/idea in such a way that our work currently aspires to re-signify academic knowledge in the UNA based on the experiences shared between us and the community of Zarcerro in order to make way for the construction of a *communiversity* (Roldán, 2012). This scenario allows for the encounter of knowledge, where a dialogic attitude that addresses the sensitive qualities to understand the overlapping dialectics in human life and its relationship with the environment is promoted.

To achieve the above, we recognize that it is a great challenge for university teachers who carry out extension activities since it requires an axiological shift, developing new sensibilities and alternatives to assume others and assume oneself with others. It is also needed a new leading role played by learners, communities, mediators, and educational stakeholders. It is finally required participation tending to critical emancipation, with awareness, where horizontal relationships, otherness, alterity, and respect for difference prevail; where the person can assume a leading role, creating spaces for the exchange of different types of knowledge to allow rethinking himself/herself from the inner self and the training task to undertake.

According to Maffesoli (2004), quoted by Caldera *et al.* (2016):

The university should be the central place where art, people's culture, the expressions of young people, the different types of daily knowledge claiming their proper place, and the metaphors of the living cultural spokespersons are recognized in the academic experiences; experiences that, as Larrosa (2003) states, have been undervalued, understood as "inferior knowledge" that modern science tried to objectify, homogenize and control, turning it into an experiment. (p. 10)

The necessary university is sensitive and demands iron will from socio-community stakeholders to transcend the dynamics of traditional and conservative university life, which disunites, isolates, and excludes experiences and life trajectories of Costa Rican communities. Some other relevant authors who support the resemanticization of the relationship between university and community are Foucault (1970), Martínez (2001), Téllez (2001), Maffesoli (2004), Larrosa (2003), and Dussel (2001).

In conclusion, academic work linked to reality enables improvement processes in the productive agricultural life of the communities. It also enriches university teaching, research, extension, and production, since it stimulates dialog between

different types of knowledge, articulates local knowledge with the knowledge of universities, promotes unlearning in the traditional way of building universities, and contributes to reflection anchored in biocentric aspects.

This gives meaning and significance to the foundation of a **dialogic and ecosystemic agricultural praxis**. The contribution of this work to the construction of an extension policy is fundamental since it provides a work process that allows understanding the link that university life must have with the daily needs of the communities and the improvement processes in the socio-community-productive life.

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