

## Environment, health and work: generating subjects for education in health and safety at work in Acre, Brazil

Josina Maria Pontes Ribeiro(a)

Tania Cremonini de Araújo-Jorge(b)

Vicente Bessa Neto(c)

(a,c) Instituto Federal do Acre (IFAC), Campus Rio Branco. Avenida Brasil, nº 920, Xavier Maia. Rio Branco, AC, Brasil. 69.903-068. josina.ribeiro@ ifac.edu.br; vicente.neto@ ifac.edu.br

(b) Laboratório de Inovações em Terapias, Ensino e Bioprodutos, Instituto Oswaldo Cruz (LITEB/ IOC-Fiocruz). Rio de Janeiro, RJ, Brasil. taniaaj@ioc.fiocruz.br

The paper proposes that environment, health and work are generating subjects, necessary to build a social technology for professional education, considering ergology as the perspective for analysis and dialogue as a teaching strategy in Health and Safety at Work for Agents that fight endemic diseases in Rio Branco, Acre, Brazil. The definition of these main generating subjects is the result of a dialogue between researchers from different areas, workers in the fight against endemic diseases, teachers and students of the Technical Course in Occupational Safety at the Federal Institute of Acre (IFAC). The historical and documentary research allowed to establish the links between the development projects that impacted significantly with outcomes in the environment and labor relations in health.

*Keywords:* Environment. Generating subjects. Work. Health.

## Introduction

Thinking about education for life is a great theoretical and practical challenge that valorizes the theoretical and methodological framework of the social sciences, especially related to teaching for health and for labor safety, so permeated by issues of social, political and cultural nature. The preparation of a proposal for dialogic teaching, autonomous, that could present responses to limit situations, is crucial in order to break with the ideology of "health education" of the 1930s and 1940s, which prescribed standards and blamed the worker by the threat to their health and safety<sup>1,2</sup>. This article presents the construction of three macrostructural themes – "Environment", "Health" and "Work" – that are needed to propose contextualization and questioning for the development of knowledge and practices of Agents to Combat Endemic Diseases (ACE's).

For this purpose, we have adopted *a priori* some concepts, in order to sustain the developed ideas. Our proposal confirms the strength and longevity of "work" as a category of social analysis, as a place of dominance and submission of the worker to capital, but also of resistance, of constitution, and of the making history in the capitalist way of production<sup>3-7</sup>. We highlight that capitalism is understood here as one of the possible embodiments of the capital, or rather, one of its historical variants, as pointed out by Meszaros<sup>4</sup>.

The consolidation of the capitalist mode of production, which is part of this analysis, occurred in the transition of the eighteenth to the nineteenth century, when the production of goods was intensified as units that synthesize values, use and exchange, and therefore ignore the complex nature of a social division of the work and private ownership of the means of production. The increasing exploitation of the workforce by the owners of means of production by extraction of surplus value, increases the accumulation and concentration of capital, as presented by Netto and Bras<sup>8</sup>. To produce an analysis of Acre, we considered its incipient industrialization and its historical condition of subordination of the Territory and, later, of the State, as a repository of raw material to both the domestic and the international capital. We also took as a reference the ergological approach on industrial activities, which highlights the work as a complex human activity<sup>7,9</sup>. Finally, we applied the expanded definition of working class, as proposed by Ricardo Antunes<sup>3</sup>, according to which are inscribed the ACE'S as part of all employees, with precarious or stable labor links.

We adopted the definition of "health" that was presented at the VIII National Health Conference, held in 1986, in which "health is a result of housing, education, income, environment, transport, employment, leisure, freedom, access to ownership land and access to health services." <sup>10</sup> Thus, "[...] health or disease is the result of the complex process of production and social reproduction, a fundamental property of the historical relations of human beings."<sup>11</sup>

The definition of "environment" is globalizing, covering correlated natural, artificial and cultural aspects<sup>12</sup>. The notion of "working environment" should be added, defined as "the set of physical and climatic factors, or any other, interconnected or not, that are present and involve the person's workplace." It is worth mentioning here that the Brazilian Federal Constitution of 1988, Article 200, VIII, states that the Unified Health System (SUS) shall, in addition to other duties, "collaborate in environmental protection, including that of the work <sup>13</sup>". Therefore, health and worker safety are thought from the need for dialogic communication of knowledge and practices that allow a conscious act, contextualized and endowed with meaning.

## **Methodology**

The construction of the generating themes refers to the need to overcome the functionalist view of knowledge and to promote a contextualized and critical approach on science and technology, in addition to its pure and simple application to productive systems<sup>4</sup>. Therefore, we consider the historical materialism as theoretical way and dialectics as methodological strategy<sup>14</sup>, taking into account the characteristic sequences of the social sciences, as pointed out by Minayo<sup>15</sup> as regards the collection, data classification and analysis obtained in bibliographical research, documentary, observation of work routines, collecting life stories and interviews.

Our proposal was developed at the Federal Instituto of Acre (IFAC) and involved a dialogic reflection on the teaching practice. Accordingly, true freedom was to ask those concerned about the content of the dialogue, and not just make them comply with a program that was previously and / or solitarily prepared without the slightest knowledge of

the reality of the subjects<sup>1</sup>. Thus, a first order condition was the approach of researchers to those who would share the pedagogical activity, since the material conditions in which and under which the students live affect their understanding of the world itself, their ability to learn and to respond to challenges<sup>1</sup>. Therefore, it was necessary to consider the worker's experience and voice, failing to treat him as a passive person and a mere object of research<sup>16,17</sup>. It follows then that the definition of a minimum thematic universe was obtained from "not only the existential experience but also from a critical reflection on the men-world relationships and men-men, implied in the first" as proposed by Freire<sup>1</sup>.

We consider the first contacts with the category of workers dating from 2012, from the "Project Fiocruz Expeditions for a Brazil without Poverty", when we conducted workshops and lectures to workers of education, welfare and health, which included the ACE's from Rio Branco city / Acre. In 2014, a new expedition held other workshops with this same public<sup>18</sup>. During the years 2013 and 2014, we developed bibliographical and documentary research, as well as collections of 10 topical life stories, increasing the possibility of dialogue with that category. In this first part, the contacts and interviews were conducted by the first author of this paper.

We add to these surveys the approved project for PhD in Bioscience and Health Education (EBS – IOC / Fiocruz) of the first author, starting in 2013, from which we conducted observation of the working routines of two professional teams that were indicated by the Municipal Health Unit (Semsa), working to combat endemic diseases in the IFAC location area (Regional III – Rio Branco / AC). The observation was carried out by a group of 18 students of the third period of the IFAC Technical Course in Safety, in six teams of three students each, integrating knowledge in the disciplines of "Professional Practices and Safety in Health Care" and "Brazilian and Regional Work and Development". We also interviewed 04 managers from different governmental and non governmental organizations (Semsa, State Health Department – SESACRE, FUNASA and DDT- Association Struggle for Life).

During the work, issues on health, environment and labor emerged and we then began to submit papers to national and international scientific events in order to obtain academic validation in areas where the issues were being registered (Sociology of Work, Environment and Health)<sup>19,20</sup>.

The systematization and analysis of data for the construction of generating themes considered the confrontation of empirical data with the existing theories, as well as the discussions on dialogic wheels with teachers and students of the Technical Course in Occupational Safety. We intend, therefore, that these issues cut across the entire process of category qualification in Acre, understanding skills as a social relation, as a result of qualities, skills, and credentials of individuals who are also socially constructed<sup>21</sup>.

## **Results and discussion**

### **Environment, health and work in professional practice of ACEs in Acre: context and theoretical reflections**

Historically the relationship between environment and health is explained from three basic paradigms mentioned by Minayo<sup>22</sup>: the biomedical paradigm, originated in classical parasitology; the paradigm of sanitation, linked to environmental engineering, and; finally, the paradigm originating in the environmental movements and social medicine, with a strong relationship with the projects of development, and that marks the emergence of the Public Health field in Brazil. To achieve this third paradigm it is necessary to transcend the technical evaluation and recognize citizenship, especially since the 1988 Constitution, in its article 200, item II<sup>13</sup>. From then on, "[...] worker's health covers the entire political dimension of health as a right of all and a duty of the State, to guarantee it, and to watch it to be guaranteed [...]"<sup>23</sup>. All this should include the arising social relationships and the psychodynamics of labor <sup>24-27</sup>.

For Franco<sup>16</sup>, in the modern order, knowledge of occupational health and safety become systematic and consistent, making sure that "the nature of the attacks on the worker's health basically depends on the material and environmental conditions of the work and the organization of work itself [...]. "

The rapprochement between occupational health and environmental health got more support in Brazil, from four landmarks that designed the concept of sustainability: (i) the creation of Workers' Health Centre for Studies and Human Ecology (CESTEH / FIOCRUZ) in

1985; (li) the publication in Brazil in 1986 of Laura Conti's book: Ecology, capital, labor and environment; (lii) the release of the Brundtland Report; and (iv) Construction of Agenda 21, created from Eco 92<sup>28</sup>.

In the Acrean scenario, the sustainability issue emerged in the traditional populations' letter, blood and sweat, that paved the way so that they could discuss today about the necessary relationship between the environment, health and work, from eco-social approaches, of political economy of environmental justice<sup>29,30</sup>. It is necessary to remember that, from the 1970s, the state of Acre was the scene of conflicts resulting from the movement of struggle for land, organized by the "people of the forest". This concept identifies traditional populations of Acre who live from extractive practice as Indians, rubber tappers, chestnut trees and riverside populations. From the death of Chico Mendes these people were supported by the environmental movement, especially for international disclosure<sup>31-34</sup>.

Accordingly, we can say that, since the time of the rubber extractivism, the workers responsible for combating endemic diseases in Acre collaborated with maintaining minimal infrastructure for capitalist production. They were always full of duties and responsibilities, but were invisible to the eyes of the public power related to their rights to health and safety. Therefore, the definition of generating themes required the contextualization about the constitution of the category, impacting their work processes brought on society.

### **Carlos Chagas' expeditions for the Special Public Health Service (SESP): First health records in Acre**

The first actions to combat endemic diseases recorded in Acre were the result of the imposition of a "standard of civilization", to ensure the survival of individuals to support the reproduction of capital. Thus, such milestones are defined from the economic cycle of rubber, in its first and second outbreak (1879-1912 and 1942-1945), to supply pneumatic and war industries<sup>30-35</sup>. The Carlos Chagas expedition to the Amazon (1910-1913), contracted by the Superintendency of Rubber Defense<sup>36,37</sup> was held in the first rubber

outbreak, to support policies that required major interventions on the environment and prevent communicable diseases from causing economic losses<sup>(d)</sup>.

Specifically related to malaria, the expeditionary highlighted that Amazonia was characterized by large land area with sparse population density, poor housing and difficulties of transportation and communication. The free distribution of quinine and hospital construction was recommended but relegated by the crisis in rubber production. Such expeditions can be considered as complaints of the life conditions of workers in rubber tree areas<sup>38,39</sup>.

Euclides da Cunha<sup>40</sup> described the gumiferous industry in Amazon, in its first phase, as "the most imperfect organization of the work that has engendered human selfishness." The only health and safety possible to acreean workers was one that the bank colonel (rubber tapper) allow him to have, that is, it was a result of traditional knowledge of mourners, faith healers or shamans, through the use of medicinal plants. One should note that the planting of vegetal species and the creation of small animals have always been illegal.

The organization of health services in the Federal Territory of Acre started in 1922, whitth the creation of the General Directorate of Hygiene and Public Health. Its activities consisted of general and specific prevention of communicable diseases, health inspection the various productive activities, in which the use of oils, burning sulfur or Green Paris was encouraged<sup>40-42</sup>. In the 1928-1929 report, the governor Hugo Carneiro said: "in rural prophylaxis nothing, however, what I found in the territory and the little I have been able to accomplish is a simple mockery, due to lack of technical personnel, lack of rigging and material and the insufficient amount of funding"<sup>43</sup>. The main health disorders cited were malaria, leishmaniasis, tuberculosis and leprosy, which required increased resources to purchase equipment and more power actions of the Federal Government, citing art. 1464 Decree No. 16300 of December 31, 1923, which determined the Union's responsibilities in

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d Register still travel Belisario Penna and Oswaldo Cruz to the Amazon in 1910, hired as health workers per company responsible for the construction of the Madeira-Mamore railway. Construction began in 1862, but only occurred significant advances from the signing of the Treaty of Petrópolis in 1907, when Brazil is committed for the construction of the road and, in turn, is attached to the Acre Brazil. Only in 1907 inaugurated the first stretch of road, to give viability flow of rubber production in the Amazon. Shipment records for inspection camps along the road there informed the morbidity rate was more than 90% of workers, with significant impact on production and pace of trabalho.<sup>38,39</sup>

the fight against endemic diseases and epidemics, as well as in hygiene and prophylaxis in the Federal District, States and Territories<sup>43</sup>.

During the second rubber outbreak, there was the organization of the SESP, in cooperation with the US Government, and an agrément was signed for sanitation activities, malaria prophylaxis and medical and health care to the people of the Amazon, offered topically in 1942<sup>36</sup>. The absence of permanent teams in the State and municipalities diffculted survival, even precariously, of hundreds of northeastern and native populations "trained" to capitalist logic. Meanwhile, the introduction of the use of dichloro-diphenyl-trichloroethane (DDT)<sup>(e)</sup> in 1945, as well as the use of chloroquine, led to the belief that by 1975 the eradication of malaria in Brazil would be possible from "campaign model". This fact was not consummated, especially from the establishment of the agricultural cycle in Acre<sup>45-46</sup>.

### **The development in the paw of the ox, malaria as an indicator of progress and the emergence of Agent of Combat to Endemic Diseases in Acre**

During the period of military dictatorship in Brazil (1964–1984), bold investments began to be made in infrastructure and there was a shift of workers to colonization projects, as well as the implementation of tax incentives that contemplated mining, logging and especially agriculture in Amazon region. The National Integration Programme (NIP) in 1970, and the National Plans for Economic and Social Development (PND)I and II<sup>33-36</sup> should be mentioned. They were necessary to create a new Brazilian geopolitics, making interventions in areas of conflict or occupying "empty seats", where it was possible to have the "penetration of international communism".

To Lima and Mamed<sup>47</sup>, the implementation of extensive livestock was of high social cost: it included the felling of the forest, the expulsion of workers living by combining latex

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<sup>e</sup> DDT is a toxic chemical that was used in World War II to prevent typhus soldiers and combat lice. It was later used in agriculture until 1985, given its low cost and efficiency, although they were reported adverse events in 1962<sup>44</sup>. The ban on their use in public health campaigns took place only in 1998. Only in 2009, by Law No. 11,936, authored by then Senator Tiao Viana (PT-AC) production was prohibited, import, maintenance in stock, marketing and use of DDT in Brazil.



extraction, chestnut gathering, subsistence farming, small livestock, and others issues. In this scenario of rural exodus, the disorderly occupation of acreean cities occurred, especially Rio Branco, and there was no public policy favoring access to housing or dignified living conditions for these workers who were expelled from their land.

With the devastation of the forest for livestock deployment, it became necessary the creation of the Malaria Eradication Campaign (CEM) and the Superintendency of Public Health Campaigns (SUCAM) in 1965 and 1970 consecutively <sup>36,37,48</sup>. In this period it was visible the political and administrative separation between powers of the National Institute of Medical Assistance and Social Welfare (INAMPS) and the Ministry of Health, the first being responsible for assistance activities to individual health and the second for assistance measures to public health (surveillance, prevention and control of communicable diseases)<sup>49</sup>.

The Acrean media reported in 1975, the Health Action Plan to the Amazon region, expected to run from 1979. It considered the need for productive occupation of the Amazon and, therefore, for the establishment of a health infrastructure and of preventive and curative programs of health medical action, compatible with the social balance<sup>50,51</sup>. The link between malaria and development projects manifested in the speech of representatives of SUCAM "malaria walks down the road and comes to progress index: where a major outbreak of malária does appear, colonization is under way"<sup>52</sup>.

In 1980, to ensure the maintenance of life in the forest via control of endemic diseases, SUCAM expanded the state service to a staff of 200 people, as follows: "the institution starts to intensify a surveillance service foccusing on the next deforestation, a process culminating in increased malaria, since the transmitters are housed in the trunk of the felled trees"<sup>51</sup>. The combat to endemic diseases in Acre was a priority in the "Planacre Project", presented to the World Bank and the other priority targets were related to natural resources survey for agricultural zoning and demarcation of indian land.

In 1988, significant changes submitted with the approval of the Federal Constitution nurture the creation of SUS. As a result, numerous rules and agreements followed, in order to better define the roles of federal agencies in the management and operation of the system, forms of financing and resource transfer mechanisms.

A parenthesis should be made to report that, from the 1970s, the environmental movement designed nationally and internationally the struggle for land in a surprisingly way in Acre. Overcoming economic backwardness, their actions contributed significantly to maintaining the future generations<sup>53,54</sup>. The impact on the national and international media about the situation of violence that tappers were submitted in Acre accelerated discussions on the implementation of extractive reserves and of formulation of sustainable development model for the region, built on the trajectory and needs of people of the forest. This project was consolidated with the victory of the Workers Party (PT) candidate for the Rio Branco Prefecture in 1992 and made effective in 1999, when, with the speech "Government of the Forest", this same candidate won election to the State government, ensuring the hegemony of Workers Party in Acre until nowadays (2015).

#### **The commodification of nature, the decentralization of health services and the labor insecurity**

From the 1990s, some areas of land with potential for rubber cultivation became part of the public property, allowing its sustainable use by traditional families. It was established in Acre what Paula<sup>53</sup> called a tie in favor of capital, referring to the acceptance of green capitalism by the State Government, which is legitimized by the discourse of sustainable development. Lima and Mamed<sup>47</sup> confirmed a polarized debate: in one side the issue of forest protection for those who live in it and another, economic exploitation organized for market participants. The struggle for land has been redirected to the fight for the preservation of the forest. The fragmentation of the working class in the field was highlighted, as well as the weight of the wood production chain. A restructuring process does also reach acrean civil public servants in urban areas, through privatizations, abolition and / mergers / secretaries<sup>54-58</sup>.

In 1991, the health system restructuring process merge the Special Public Health Service Foundation (FSESP), with part of the National Departments of Basic Health Actions (SNABS), of the Health Special Programs (SNPES) and of SUCAM, constituting the new National Health Foundation (FNS). During the Collor government (1990-1992), it was identified that 66 acrean workers had their employment contracts terminated without cause,

and subsequently were reinstated by Law No. 8,878 / 94. The deterioration of the malaria framework in Acre was an immediate result<sup>57</sup>, especially in areas hard to reach, as was the case of Sudam Farm, with a population of 163 people from whom the 102 blood slides collected yielded 77 positive results for malaria in February 1995.

From the Federal Constitution of 1988, measures were adopted to decentralization, through laws and decrees that have organized services in increasing levels of complexity for specific geographic units and defined publics. Integral care was guaranteed in the Organisational Contract of Public Action (COAP). From 1999 to 2000 organizational reforms in the field of public health emerged, starting the process of decentralization of health services in Acre, including: a) adoption of SESACRE name and resetting State organization chart; b) implementation of computerized systems for management units; c) creation of the epidemiology interinstitutional committee; d) reform and expansion of the health facilities network; e) an agreement signed between SESACRE and FUNASA (previous FNS) providing the State management of 305 federal employees to control vector-borne diseases<sup>(f)</sup>. As a result of this process, in 2001 from a total of 22 municipalities in Acre, only one was enabled with full management of the Municipal Health System; 16 were enabled to primary care and five were not enabled<sup>41,59,60</sup>.

From 1995 to 1998, the State government started a program of privatization, termination, merger, municipalization and incorporation of institutions and entities of the direct or indirect administration, as well as an incentive program to the dismissal or voluntary resignation<sup>61</sup>. The dependence on funding from the federal government to integrate the national scene and the absence of industries that absorb the contingent of urban workers, explained the expansion of unemployment and labor insecurity in Acre, from the neo-liberal reform.

To foster the process of decentralization in Acre, in 2006 it was signed the "Pact for Health" by Ministerial Ordinances No. 399 of February 22, 2006 and No. 648 of 28 March 2006. The regulation of ACE's category is also dated this same year, through the enactment

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<sup>f</sup>About this subject was recorded in 2000, the provide of 26,000 mid-level workers FUNASA to states and municipalities, and in Acre, the workers of this governmental agency not yet retired were spread Districts Indigenous Health / FUNASA, SESACRE, SEMSA. In Acre such assignment was regulated by Convention No. 001 /2000, signed between FUNASA and SESACRE.

of Law No. 11350 of 05 October 2006, which was amended by Law No. 12,994 of June 17, 2014<sup>61-63</sup>. However, only from the Decree 7508 of June 28, the acreean municipalities fully assumed the implementation of health surveillance actions. An exception occurred in the city of Cruzeiro do Sul, where high numbers of malaria justified achievement of agreement between public organizations in which the State responsibility would manage and finance by hiring staff and necessary infrastructure, which included the acquisition of Equipment for Individual protection (EPI) for ACE's.

Precariousness of work emerged more intensively from the speech of SUS implementation, via transfer of public production of goods and services to the third sector. Through Law 2031 of November 26, 2008, the creation of the Social Service of Acre Health (Pro-Health Acre), a parastatal institution of private, non-profit collective and public service interest, autonomy on management, balance, budget and financial, own staff and indeterminate term. Therefore, for a new relationship with the environment, decentralized health policy incorporated the flexibility and precariousness in the labor ACE's, who came to be thought of qualification proposals that would realize this historical process in construction.

## **Final remarks**

After reviewing the literature and listening to protagonists of technical actions, policies and health carried out in Acre, the subjects previously treated constitute the repertoire that we consider relevant to nucleate health education actions and work safety for ACE's in the State. The definition of topics is referenced in the paradigm originated from environmental movements and social medicine. Strong relationship with development projects that marked the emergence of public health in Brazil, from which working relationships are built in the modern order. Then, once capitalist expansion was guaranteed and injuries resulting from human action on the environment were generated, it has become necessary to develop technologies (new products or processes) to control such negative effects, and investments in health were justified and certain chemicals were released or withdrawn from the market, as happened with DDT. As the focus has always been on productive development, and not on

environment of which we are part and in which established social relations of production, measures to support worker safety and protection were considered only when directly affected the market.

The construction of the generating themes "environment, health and work," became necessary to accomplish a real integration of socio-political, cultural and economic dimensions. It aims to remove the society and the worker from a situation of total alienation regarding the means of production, so that the mere reproduction of the processes and definitions as well as the quantification of cases were no longer relevant to the explanation. Therefore, the proposal of the issues will allow to work the existing boundaries between the organic and the social, the technical scientific and the traditional knowledge. This research will unfold on the development and testing of educational proposals tuned with these perspectives, applied to the reality of the public coming to IFAC, and providing technical education in health and safety.

#### **Collaborators**

All authors worked in the design and final draft of the article. JMP Ribeiro was the author and TC Araújo-Jorge is the advisor of the PhD project that originated this article. V Bessa Neto collaborated in the final review of the text and participated directly in the construction of generating themes process, the description of which led to the drafting of the article. TC Araújo-Jorge provided the english version.

#### **Acknowledgements**

The authors thank the workers who have acted or who still acting in the combat to endemic diseases in Acre. We also thank the students Lisiane Ferreira, Ketlen da Costa, Maria Targino, Ana Paula Silva and Patricia Silva and the researchers Peter Plese and Emanuela dos Santos, by collaborating with research and extension activities that enabled the preparation of the article. The research was funded by the Cooperation Agreement No. 004 of August 29, 2012, established between the Federal Institute of Acre (IFAC) and the Instituto Oswaldo Cruz (IOC-FIOCRUZ).

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Translated by Carolina Ventura