

TRAMIL DIFFUSION (TRADIF) Experiences and Lessons

"TRAMIL, POR SER POPULAR, NO DEJA DE SER CIENTÍFICO TRAMIL, POR SER CIENTÍFICO, NO DEJA DE SER POPULAR"

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TRAMIL DIFFUSION Experiences and lessons



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PRODUCTION AND TRANSLATIONS SPONSORED BY

"Association de Recherche en Épidémiologie et Biodiversité (AREBio)", Martinique



2021

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Chapter 1. Introduction

1.1 TRAMIL

TRAMIL a research program applied to popular medicine in the Caribbean, initially called Traditional Medicine in the IsLands (TRAMIL), was founded in 1982 to improve and validate popular practices in the use of medicinal plants, with a clear interest in fixing the boundaries between what can be a simple belief and what is useful and effective (http://www.tramil.net).

TRAMIL has been developed for almost four decades, focusing basically on validating, from a scientific perspective, popular knowledge of medicinal plants and evaluating the safety and efficacy of the use of medicinal flora for primary health care in the Caribbean communities (Germosen- Robineau, 2014). With the aim of making available to the peoples and the basic paramedical personnel, practical knowledge for the treatment with plants, reducing the costs of primary care of diseases, in harmony with popular tradition. This program is carried out under the coordination of a multidisciplinary group, which includes ethnobotanists, phytochemists, pharmacologists, physicians, and members of the Caribbean communities.

Through ethnopharmacological surveys, TRAMIL has documented the knowledge of medicinal plants in the Caribbean communities, selecting for study and analysis only the uses of plant parts that present a significant frequency of use $\geq 20\%$. These species have been incorporated into the scientific validation process including toxicity, chemical composition, and biological activity studies, prior to recommending traditional recipes and popular uses with safety and efficacy criteria.

At present, surveys have been carried out in 29 territories of the Caribbean Basin, where more than 600 significant uses have been registered, of which, 393 uses are recommended (REC) and 6 uses have shown toxicity alerts (TOX). Presently, there are still many uses in the research category (INV) (TRAMIL, 2014). TRAMIL defines as **TOX** the use of part of the plant that has been proven toxic by published scientific information and / or toxicity tests, for which it is advisable to discourage its traditional use and **REC** as the recommendation of the use of part of the plant, endorsed by one or more criteria: significant traditional use documented in the TRAMIL surveys, published scientific information, toxicity studies and / or pharmacological validation.

The results achieved by TRAMIL have been attained thanks to the collaboration of almost 200 specialists from various disciplines, from 49 universities and research centers, the vast majority colleagues from 25 Latin American countries, including 22 countries from the Caribbean Basin. (www.tramil.net).

Over the years, progress has been made in the research process and the results have been disclosed in various editions of the Caribbean Herbal Pharmacopoeia, to contribute to improve the health of Caribbean communities. In addition, the information generated because of this validation process has been disseminated by various means in the communities, as well as to health professionals, students, ministries of health and universities, among others, within the framework of the TRADIF Program (TRAMIL Diffusion).

1.2. TRADIF Conceptual Framework

From its beginnings, TRAMIL considered the dissemination of the knowledge generated during the validation process of utmost importance, to restore knowledge to the surveyed communities themselves and expand its dissemination in the rest of the communities and countries of the Basin, promoting its use in an accessible and safe way, to improve community health and help preserve popular knowledge.

The conceptualization of the TRADIF Program has evolved gradually, adding approaches guided by the significance that scientific validation of the popular uses of medicinal plants has for different sectors of society. All of these add to TRAMIL's objective of "contributing to community health in the countries of the Caribbean Basin", and the development of actions to meet the challenges of protecting of plant species, rescuing knowledge of cultural groups and germplasm of species useful for community health.



Photo: TRAMIL founders Lionel Germosén-Robineau and Cristobalina Amparo, peasant leader and pollster in Zambrana, Dominican Republic (1982).

Among the first approaches to TRAMIL dissemination, the following were considered:

Support, via the regional ministries of health, a health policy program to reinforce and regularize the proper use of medicinal plants, incorporating universities, healthcare programs, and regional research networks.

Promote, in health-related faculties and universities, the development of training programs for health professionals on scientifically validated uses of medicinal plants.

Encourage the development of educational programs on the safe and effective use of medicinal plants for and by the public.

These approaches have evolved, being enriched according to the TRADIF experiences developed in the different territories and sectors of society. In 1999, following a meeting to discuss the issue of medicinal plants in primary health care, in Central America and the Caribbean, with the representation of the ministries of health and state universities, some lines of actions were recommended to be developed in the region:

- 1) **Community-based health promotion and education** and the establishment of family and community gardens of medicinal plants in health centers, schools, and botanical gardens.
- 2) **Health professionals training** in continuing education programs about medicinal plants.

- 3) **Human resources training** in the health sector incorporating the topic of medicinal plants in the study programs.
- 4) **Research support** for the identification and scientific validation of medicinal plant uses in each of the countries of the Basin.
- 5) **Promotion of the domestication and cultivation** of scientifically validated medicinal plants, according to the priorities in each country.

In 2012, within the framework of the twelfth TRAMIL Workshop in Cartagena, Colombia, a meeting was held to evaluate and rethink the scope of the TRADIF Program. In this meeting, it was emphasized that the dissemination of TRAMIL in traditional communities must firstly carry a message of appreciation and respect for their practices and their conceptions of health, over the "effort" to disseminate criteria of efficacy and safety with accounts from the Western System of Knowledge, in order to contribute to the conservation of local knowledge and avoid its loss, inducing communities to use information that provides scientific validation, and to promote the interest of new generations in becoming familiar with and learn traditional knowledge.

After this process of evolution of ideas, TRADIF, nowadays, not only focuses on returning to the surveyed communities what was learned during the documentation and validation of popular knowledge about the ways of using plants, nor does it focus solely on the training of the health sector and communities, or only values scientifically validated knowledge to guarantee safety and efficacy in primary health care, but also recognizes and promotes the importance of protecting, reexamining and saving the traditional knowledge that communities possess, accompanied by the scientific knowledge.

Thus, today dissemination tools are planned in relation to an objective that fits the sector to which they are developed, and TRADIF dissemination takes on certain characteristics and special accents on concepts, depending on the target groups. For example, the restitution is carried out in those groups that participated in the research of traditional knowledge (surveys), training is carried out in a timely manner towards the sector of health professionals, knowledge reappraisal is emphasized with young people and adults, while in the case of children, the only aim is to inform, encourage and promote the desire to discover (Figure 1) medicinal plants. For this, the TRADIF program has different dissemination instruments to achieve its objectives.





What is TRAMIL Dissemination?

TRAMIL Dissemination is a program that makes available the knowledge of the uses of Caribbean folk medicine scientifically validated by TRAMIL for primary health care. The information aimed for different sectors or "target groups" of society is transmitted in a simple and practical way respecting the traditional knowledge of the communities, through tools that guide the actions of informing, reappraising, returning, and training, to encourage the use of medicinal plants in primary health care.

Its purpose is to show society that the health problems that are generally solved with selfmedication can be solved using medicinal plants and that this valuable resource is available at a minimum cost and based in traditional knowledge.

This is in turn, an action-research program that constitutes a training tool for health professionals, faculty, and students in health-related careers connected to primary care programs, both aimed at research and for solving the main non-chronic health problems, with a holistic and integrative perspective between conventional medicine and traditional knowledge, aiming at the well-being of people and their community.

1.3. TRADIF Experiences in the Caribbean Basin

TRAMIL's dissemination activities have been carried out in 21 territories of the Caribbean Basin, each of which has contributed different experiences that have allowed to shape a diversity of strategies and tools for their implementation in local communities. Among these, we can mention the workshops for knowledge restitution, workshops for the reappraisal of popular knowledge, training courses for the health sector, establishment of botanical gardens and seed banks of useful species, the use of educational posters and radio programs, among others. These activities and their respective training materials have been implemented in: Barbados, Belize, Colombia, Cuba, Dominica, Grenada, Guadeloupe, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Costa Rica, Panama, Dominican Republic, Venezuela, Trinidad & Tobago, Puerto Rico, Jamaica and Martinique,

It is important to note that a commitment when conducting a TRAMIL survey is to carry out workshops to return survey data and validation information. These have been implemented in almost all the countries mentioned.



Photo: TRADIF in Zambrana, Dominican Republic.

In a complementary way, workshops have been implemented in communities that do not correspond to the localities where the TRAMIL surveys were carried out, in this case, the information contained in the booklet Caribbean Medicinal Plants for Primary Care was used to promote among communities the reappraisal of popular knowledge and provide information for primary healthcare using plants with safety

and efficacy criteria. In Mexico, 31 workshops have been offered, aimed at 622 people from 49 marginalized Mayan communities in the state of Yucatan. Following the same scheme, a TRADIF workshop was developed in Colombia, specifically in the San Basilio community, aimed at children, youth, and adults; in Venezuela, dissemination work was carried out in various neighborhoods close to the surveyed communities; and in Cuba workshops were held to disseminate results among grandparents from the University for the Elderly in Havana. In Puerto Rico, in addition to workshops, talks have been organized using the Caribbean Medicinal Plants for Primary Care booklet as source. In Costa Rica, workshops have been held for women in different places to promote the development and use of TRAMIL medicinal plants.





Photo: TRADIF activity with housewives in Mérida Yucatán, México.

It is important to mention that in various countries training courses have been offered to health professionals. This is very significant since this activity is related to TRADIF objectives related to the ministries of health and the collaboration of the universities.

We can mention some specific cases such as **Cuba**, **Panama**, **Honduras**, and **Nicaragua**.

Photo: Physicians and Health Technicians training in La Paz, Honduras, 2005.

A tool that has been widely used in the dissemination of the uses of TRAMIL plants in the Caribbean countries has been the establishment of gardens and the inclusion of plant collections in established national gardens. In **Panama**, 5 community gardens of medicinal plants with scientifically validated uses were established and linked to the health

centers of each community. In **Mexico**, 6 collections of medicinal plants, including TRAMIL plants, were established, four of which are managed by traditional indigenous healers from the state of Yucatán. In **Haiti** a community garden was established, and a section dedicated to TRAMIL plants was included in the ethnobotanical section. In **Martinique** the "emergency garden collection of medicinal plants" was established and structured according to the Caribbean Medicinal Plants for Primary Care booklet (the same is being done in Guadeloupe); in **Dominica** a trail with TRAMIL medicinal plants was developed in the National Botanical Garden. In **Costa Rica**, the Bougainvillea-TRAMIL Agroecological Garden of Medicinal Plants was established, where training is given to primary school students from the Matina Canton in Limón. Furthermore, the "Sacred Seed Garden" of medicinal plants was established, where the medicinal plants reported in the Caribbean Herbal Pharmacopoeia were incorporated.



Photo: Medicinal plants garden in Yucatán, México.



Photo: Community Garden in Cocle, Panamá

Other dissemination resources that have been implemented are the posters, in **Panama**, 22 posters were designed, corresponding to 22 species of medicinal plants. The Ministry of Health in Panama published them officially, distributing them in rural clinics and scientific events mainly. Information bulletins with TRAMIL results have been published in **Trinidad & Tobago**. Radio programs have been presented about TRAMIL plants in **Dominican Republic**, **Haiti**, **Guadeloupe**, **Costa Rica** (Caribbean Radio "Talking about the TRAMIL Program") and in **Mexico** (Yucatán - "The power of plants"). In **Guadeloupe**, posters and games were produced to disseminate information in the communities and distributed on DVD discs. In **Mexico**, guides to medicinal gardens, brochures and



propagation manuals were produced. Likewise, documentaries about TRAMIL in **Dominican Republic**, **Guatemala**, and **Costa Rica**, were produced by the official TV Station of the French Antilles.

Photo: Community Garden in Coclé, Panamá

1.4 Success indicators

Throughout the years TRAMIL has carried out a diversity of dissemination activities to promote scientifically validated uses of medicinal plants. However, evaluating the delivery or success of these activities is still, to a large extent, an awaiting task. One way to determine how to measure the progress or scope that TRADIF has had and may have in the dissemination of the use of medicinal plants for primary health care is through trends in success indicators, which although have not been established by TRAMIL serve to point out certain aspects or criteria that help to direct the dissemination and allow to assess the program activities.

1. The fulfillment of **TRADIF restitution activities** in the communities where the TRAMIL surveys were carried out, which allows to show the survey's participants the results of the scientific validation of the traditional knowledge they possess and its importance for health care.

- 2. The increase in **diverse target groups** (children, young people, housewives, health professionals, universities, and the scientific community) which take part in TRADIF activities in the communities, allowing the expansion of dissemination to other stakeholders linked to the use of medicinal plants in society and leading in the long term to greater likelihood in medicinal plants use.
- 3. The link to the ministries of health in the countries that make up the region, allowing to carry out broader dissemination activities with the support or endorsement of the local authorities, strengthening the working links with the universities and national and international organizations.

It should be noted that these aspects or criteria complement each other, causing a more effective dissemination by including all sectors involved in community healthcare. Another important aspect is the evaluation of the activities carried out during the dissemination, which allows to measure progress and improve the strategies to deliver information, because the knowledge about the use of medicinal plants is influenced by different variables such as age, gender, schooling, and place of residence, to name a few. An important point to consider is that these aspects and criteria must surpass by having a **scope** at the individual, community, country, and regional level, or beyond, reflecting the use of medicinal plants for community healthcare at a larger scale. Scope is undoubtedly a fundamental variable to measure the significance of the program, especially at the community or country level.

1. **TRADIF restitution activities**

The restitution activities have been carried out in communities located in 21 territories of the Caribbean Basin, or 73% of the sites where TRAMIL has conducted surveys. For example, in 1996 in Guatemala, a TRADIF workshop was offered in Livingston to the Garífuna community that participated in the TRAMIL survey; and in Panama, dissemination workshops about plants with scientifically validated uses, aimed for mothers in households, were held in the Province of Colón and the Atlantic Coast.

2. The increase in diverse target groups

Throughout the TRAMIL diffusion experiences, different target groups have been included, such as children, teenagers, the elderly, young people with disabilities, universities, and the scientific community. Each one can contribute in their respective environments to the dissemination and use of medicinal plants, either by informing, reappraising, and training. In the same way, educational strategies have been added to the TRADIF portfolio, allowing to apply hands-on and educational approaches, such as the establishment of medicinal gardens, the use of posters, brochures, and radio programs, among others.

For example, in **Mexico**, through the Mayab Medicinal Gardens Network, it has been possible to promote the recognition of the use of medicinal plants remedies recommended by TRAMIL and collections of plants have been incorporated into various gardens in the region. In **Martinique** and **Guadeloupe**, an ethnomedicine and ethnopharmacology course was structured at the UA (Université Des Antilles). An initiative called Emergency Plant Library, consisting in the establishment of a collection

of TRAMIL medicinal plants organized according to their uses for health problems as described in the Caribbean Medicinal Plants for Primary Care booklet, is promoted in communities for prevention and health emergencies.

3. The link to the Ministries of Health

The relationship with the ministries of health had an important milestone in Panama in 1999, where a meeting was held with the Ministers of Health in Central America, Cuba and the Dominican Republic and leaders from the state universities in the same countries. In the meeting the ministries stated their interest in joining efforts with the aim of finding options for the integration of scientifically validated medicinal plants uses for primary health care, recognizing them as an important support for this level of care and asserting the importance of the promotion of this resource in national health systems. In addition, recommendations were expressed regarding the training of healthcare professionals and primary healthcare faculty at universities, among others. Through the agreement of the Ministries of Health, it was possible to assign physicians, nurses, nursing assistants, environmental health technicians and rural health assistants to participate in TRADIF courses, workshops, and seminars held in Guatemala, Honduras, Nicaragua, Costa Rica, Panama, and the Dominican Republic, contributing to the reappraisal of the use of medicinal plants as a healthcare resource for our populations. Between 1998 and 2005, more than 700 people were trained, 75% of which did not have prior training in medicinal plants, the majority were women working as general practitioners, pediatricians, gynecologists, dentists, nurses, and nursing assistants.

The contributions from the association with the Ministry of Public Health in Cuba, represent another successful account. In 1990, under the ministerial resolution of May 5, 42 medicinal plant species with uses scientifically validated as described in the Caribbean Herbal Pharmacopoeia were included in the public health system. Another case is that of the Ministry of Health in Panama, where under ministerial resolution the area of Traditional Medicine was created and allocated to the National Directorate for Health Promotion. In addition, the establishment of medicinal plant gardens in clinics in the Province of Colón was promoted. The Ministry also endorsed the development of twenty-two educational posters about medicinal plants uses based on scientific information contained in the Caribbean Herbal Pharmacopoeia, for distribution in healthcare centers.

In Honduras, a collaboration agreement was established between the Public Health Area V, Region II Secretariat, and the Honduras Inter-institutional Committee of Natural Medicine (HICNM). As well as a cooperation agreement between the Ministry of Health and the Nicaraguan Network of Traditional Health Systems with Medicinal Plants and other Alternatives (Note: acronym in Spanish PLAMOTANIC). In 2005, the Honduras Ministry of Public Health and the General Directorate of Regulation held the "Conference: Scientifically validated medicinal plants, Primary Health Care and Regulation", with the aim of promoting the process of awareness and discussion related to the medicinal plants as resource in health policies, allowing to lay the foundations of an interinstitutional proposal in Primary Health Care. TRAMIL proposed a list of fifty uses / medicinal plant parts scientifically validated for Primary Care and discouraged the use of eight uses due to certain risks or toxicity.

In the Dominican Republic, the Ministry of Public Health and Social Assistance (Note: acronym in Spanish SESPAS) re-printed 2,000 copies of the second edition of the pharmacopoeia for distribution among their physicians and in rural clinics.

In 2008, Ministries of Health in Panama, Cuba, and the Dominican Republic endorsed the Caribbean Medicinal Plants for Primary Care booklet. This booklet has been the most used TRADIF resource for workshops offered to different target groups. Currently, the Ministries of Health in Brazil (Towards a Caribbean Pharmacopoeia. 1995), Haiti, Martinique, Cuba, and Colombia, use the Caribbean Herbal Pharmacopoeia as an important scientific source about medicinal plants uses.

The joint work between NGOs that develop health programs with medicinal plants and the ministry of health, for example, through TRAMIL, the *Colectivo de Salud Popular* (Note: acronym in Spanish COSALUP) NGO in Santo Domingo, Dominican Republic, and the Ministry of Health, managed to train community facilitators in medicinal plants uses and through them more than 500 people were trained in the use of medicinal plants in their communities.

Undoubtedly, being able to expand the link with the ministries of health in the Caribbean Basin is a challenge and an opportunity to increase the scope of TRAMIL's dissemination in the communities.

Chapter 2. Strategies and Methodology

2.1 General considerations

The TRADIF Program is based on the information that TRAMIL has produced, which is available in the Caribbean Herbal Pharmacopoeia and on the TRAMIL website. Before implementing the dissemination, it is necessary to understand the nature of this complex information, since it embodies the cultural diversity of the Caribbean communities, incorporates plant species of the flora from the different territories of the region, only the traditional knowledge is validated, and the scientific validation is the product of different research studies. Some of these features that make up the information vary depending on the territory. Therefore, to understand their scope, they are organized in four contexts which must be considered when carrying out TRADIF dissemination events: **cultural**, **biogeographic**, **validated traditional information and scientific validation data** (Figure 2).

Under the **cultural** context, the language or dialect of the community where the TRAMIL information was obtained, the local name of the plant used and the accounts of diseases or symptoms must be taken into consideration, since these factors are influenced by the cultural traits of each territory, which is reflected in the diversity of local names (common or vernacular) assigned to a specie. These may be the same or different in the territories, for example, *Aloe vera* is a specie known in some Caribbean countries as "sábila" in others as aloe and in others as lalwé. Culture also influences the precise account of the disease or symptom since this can be understood differently in each territory. It is important to recognize that the local name reported in the pharmacopoeia is not representative for all countries, but only for those where the reported use was significant.

In the **biogeographic** context, the description of the plant and its distribution must be considered. That is, when selecting the use of a specie, it must be considered whether it can be found in the territory where the dissemination will be carried out, since not all the species with significant uses are distributed naturally in all the countries that make up the Caribbean Basin. This is due to the speciation and dispersion processes that occurred on the islands and the continental portions of the Basin and to the fact that most of the Caribbean Basin is made up of islands of different sizes. Through the scientific name and its botanical description, the aforementioned information defines the identification of the species of interest, which is the same for both, those who deliver the information and those who receive it.

Within the **validated traditional information** context, the part of the plant used, the form of preparation and its dosage are taken into consideration. This data does not change, it must be presented for all territories strictly as reported for each species in the Caribbean Herbal Pharmacopoeia, because the scientific validation targets this information, due to frequency analysis of use in the community where the TRAMIL survey was carried out. Thus, this validated data such as the form of preparation, must be made clear to the people to whom the dissemination is directed. It is known that in some communities, due to their history of use of traditional medicine, the form of preparation of herbal remedies for the same specie may be different, for example a decoction compared to an infusion. In the **scientific validation data** context, information such as plant chemistry, biological activity and toxicity are considered. This factor, like the previous one, does not change among territories. In this section you will find all the information gathered that allows to determine the effectiveness and safety of the significant uses of the species.

The basis of TRAMIL knowledge about medicinal plants suggests that to implement dissemination activities in a community that is not part of TRAMIL surveys, the cultural context of the community in relation to its language, its knowledge of medicinal plants and the community health conditions must be researched. Similarly, to conduct an effective dissemination, it is necessary to consider whether the activity is taking place in an urban or rural area and who are responsible for the community health.

The depth of the TRAMIL information delivered in the dissemination will depend on the target group to whom it is directed and the specific objective of the dissemination activity, because there is technical information that is related to the studies that led to the validation, scientific information such as the phytochemical information of the parts of the plants, the biological activity of the preparations and the compounds, and the toxicity tests carried out. Another element that should not be forgotten is that contraindications related to the use of medicinal plants have to be offered and the importance that if the health problem continues, a health professional in the nearest clinic must be consulted.



Figure 2. Elements of TRAMIL information included in TRADIF

2.2 Methodology

The TRADIF methodology is the resource defined to return the validated information in the areas or communities where TRAMIL surveys on the use of medicinal plants as the first resource for health care were carried out; as well as the methodology to promote the safe and effective use of medicinal plants in Primary Health Care.

Formerly, the methodology proposed the participation of several stakeholders: a local TRAMIL member, a "tramiler" from a neighboring country who speaks the same language and who has previously participated in at least one TRADIF workshop, collaborators who carried out ethnopharmacological surveys, community members, one or two communicators, a physician and / or nurse from the local health clinic, at least one individual from the local health agency and groups or organizations interested in such dissemination.

This methodology has been implemented also in TRAMIL dissemination activities carried out in areas or localities different to those where the TRAMIL research was carried out and that have an interest in the dissemination of TRAMIL results. It can also be implemented by health education or health professionals and researchers from related areas, with the mentorship and supervision of a "tramiler" from the country or a neighboring country.

This is a participatory, learning-by-doing methodology, attentive to the cultural diversity, languages, biodiversity, and economic reality of the Caribbean methodology. It is a methodology that adapts, organizes, and plans, according to the local resources of each country and according to the target population to which it is directed, being the TRAMIL Dissemination Workshops the main mechanism.

The methodology establishes five steps to organize a TRADIF workshop:

- 1. Identify **community stakeholders**, be it the public, leaders, organizations, or institutions interested in getting involved in the topic of medicinal plants (health clinics, schools, churches, homemakers, neighborhood councils, youth organizations, municipalities, among others).
- 2. Determine which are the research results, that is, the validated uses that are of interest to the participating country, region, or territory. It should be noted that validated uses of plants from neighboring countries that are also present in the country or territory where the workshop is organized can be included. To be more effective in the organization of the information, a list of plant species and uses / plants parts of medicinal plants that will be addressed in the workshops can be arranged, with information on the scientific name, vernacular name, part of the plant to be used, the validated significant uses and the form of preparation.
- 3. Identify the **local resources** available, including educational material such as the plants species to be used, posters, signs, brochures or folding cards, puppets, videos, tv set, flip charts and data shows, among others. In addition, identifying the local infrastructure to visit with the participants, for example, demonstration gardens, botanical gardens, herbariums, and research laboratories, among others must be done in advance.
- 4. Define the **program** to be developed in a hands-on and feasible way, considering the local resources detailed above and establish the scope of the program based on the available **budget**.

5. Establish the specific and individual **commitments** of the participants, in accordance with the reasonable compliance capacities related to the TRAMIL dissemination program.

Each workshop must have a TRADIF work plan or scheme, which includes the topics to be discussed, objectives, timeline, techniques, materials, and persons in charge (local "tramiler", teachers, health professional, researchers, among others). This plan must include the date and time of the activity and the person in charge. The time to deliver the workshop depends on local conditions, available resources and / or the thematic content that is defined. It can be from 1 to 5 days, or from 8 to 40 hours distributed in different sections or periods. Other methods of dissemination can be developed with a different workload, such as those developed in universities with the collaboration of the TRAMIL Program.

2.3 TRADIF Approaches

TRADIF approaches are nothing more than educational techniques that allow to disseminate research results. These have been developed, enriched, and perfected through time and experience. These approaches have been defined and used according to the thematic content designed for each target group to which the dissemination is directed and are organized for methodological purposes in three topics: **basic botany**, **rational use of medicinal plants and good practices** and, **educational activities in the prevention and promotion of the use of medicinal plants in the community**.

1. Basic Botany

This thematic content aims to familiarize participants with botanical knowledge that will allow them to understand the wide world of plants in general and of medicinal plants. Some of the topics included are also related to general recommendations for their conservation and informed use. This approach includes explaining the importance of the texture of the plant for its preparation, in addition to introducing the participants to what an herbarium and a botanical garden are, their importance, and if there is one in the locality, a guided tour is recommended so that they can observe their work. The applied and participatory aspects are carried out through the following techniques: **botanical walk** and **hands-on botanical class**.

Botanical walk:

Consists of taking a short excursion with the participants through the area where the workshop takes place, or a nearby place, where there are wild plants, to look for medicinal plants that they know and to chat about them, their similarities and differences found, as well as their description, shape, color, smell, taste, whether they are healthy or not, etc.

The importance of an adequate collection of the plant for its botanical identification during the scientific research process is explained on site, a demonstration is made on how to collect specimens, the minimum material required and how the specimen is protected.



Photo: Botanical walk. Collecting samples in Zambrana, Dominican Republic



Photo: Botanical walk in Zambrana, Dominican Republic

A botanical walk can also be accomplished with biology or health sciences students, either in a botanical garden or in a medicinal plant's demonstration garden located in a residence, a community, or a health clinic. In this case, dialogues with the participants are promoted. Once the walk is finished, the experience is shared with the group. This activity is led by the local collaborating biologist or taxonomist of the TRAMIL Program and / or the workshop facilitator.

Practical botany class:

This activity is carried out to familiarize the participants with the introductory aspects to identify in a medicinal plant, such as color, smell, taste, its parts, texture if it is hard or soft, if it is healthy or sick, similarities and differences. Emphasis is placed on the importance of knowing the part of the plant to use and how to prepare it, according to the

texture. For the development of the training, the participants are asked to bring a medicinal plant that they have available in their home, community, or neighborhood.

They are distributed into groups and a work plan is developed.



Photo: Workshop with health professionals in Santo Domingo, Dominican Republic.



Photo: Collaboration with the Botanical Garden in Santo Domingo, Dominican Republic.

At the end, in a plenary session the results of the group's work plans are presented. This activity is generally carried out when there is no possibility of visiting a botanical garden and / or herbarium. The activity is led by the local collaborating biologist or taxonomist of the TRAMIL Program or the workshop facilitator.

2. Rational use of medicinal plants and good practices

This approach is very important, since it is directly related to the TRAMIL aim of validating the quality, safety and efficacy of significant uses, and the promotion of the informed use and good practices in the preparation of medicinal plants remedies. Some of these aspects are related to the plant itself, for example, that the part of the plant is washed prior to use, that it should not show signs of disease, that it is the appropriate plant part to use; others to the preparation, such as the preparation according to the method required, be it infusion, decoction, poultice, baths; and to the usage, either topically or orally. It is developed through the following hands-on activity:

Hands-on class of herbal preparation methods:

Its purpose is to promote the informed use and good practices in the use of medicinal plants, as well as to develop skills in the preparation methods for family members.

For this activity, the TRADIF booklet Caribbean Medicinal Plants for Primary Care is used as a guide for preparing the herbal remedies. Participants are distributed in groups, they are provided with a work plan, they are given the necessary materials to use, and the herbal remedies are prepared as infusion, decoction, poultice, or baths.



Photo: TRADIF booklet page.

Once the group has concluded the work plan, a plenary meeting is held, in which the procedure, warnings, recommendations and contraindications

Photo: Rural Health Assistant shows the preparation of an infusion with Cymbopogon citratus leaves (lemongrass). Panamá.



of the preparation are presented. The assessment and recommendations about the hands-on class are gathered.

Photo: Binational Workshop (Honduras-Nicaragua) in Estelí, Nicaragua





Photo: Health activist shows how to make a decoction with Zingiber officinale (ginger) rhizome. Honduras.

The materials needed for this hands-on class are:

- fresh plant's parts selected for the hands-on class
- pot and clean water to wash the plant material
- cutting table to slice the plant material
- kitchen knives
- 1 liter pot with lid
- medium size strainer
- coffee cup
- coffee spoon
- gas, electrical or fire stove to make herbal preparations

Photo: Community leader shows how to make a poultice with Senna occidentalis leaves. Nicaragua.



2. Community health prevention and medicinal plant's use promotion educational activities.

These techniques are developed to promote health prevention with medicinal plants, to treat common diseases in the family and community, as well as to encourage good practices in the use of medicinal plants. In addition, they foster creativity among the participants attending the workshops, by providing ideas to apply them in their communities. In each of these, a simulation of each activity is carried out, as well as the steps to follow to organize them in their community. The main techniques used are **educational talks**, **home visits** and **sociodrama / community theater**.

Educational talks:

These has the purpose of communicating knowledge about a certain topic, for example, the use of a certain parts of a medicinal plant, a health problem and how it can be treated using medicinal plants, or a health topic of interest to the community in which medicinal plants can be used to approach it.



Photo: A rural health assistant uses a Carica papaya (papaya) poster during a demonstrative talk about skin problems. Panamá

homemaker with knowledge about medicinal plants in the community, can offer the talk. This talk can be offered in a waiting room of a community health clinic. during a community gathering, in a classroom or in any place where



A health promotor, a health assistant, a health technician, a community leader, or a

educational, informative and health promotion activities are allowed and supported. The time

required will depend on the objectives and topics

Photo: Poster from the medicinal plant's booklet.

0 0 0 0 1 2

that will be presented. It should be short, no more than 10-20 minutes covering specific objectives.

The educational materials used are instructive sheets or posters of medicinal plants developed from the Caribbean Medicinal Plants for Primary Care booklet and samples of the fresh plants that we will covered in the talk.

To launch the activity within the framework of a TRADIF workshop, working groups are organized, each group is given a working guide in which the topic to be developed is assigned, for example: use of linden leaves (Justicia pectoralis). Time is established to implement each step in the guide, the first step being reading the working guide, and discuss the assigned topic after reading the support material provided (10-15 minutes).

In the next step questions about the working plan and reference readings are answered with the support of the facilitator (20 minutes). Then, the distribution of roles and their tasks is completed according to the educational aims (10 minutes). The fourth step consists of the group rehearsal of the assigned tasks (30 minutes) and the last one is the presentation of the talk in the workshop plenary session. Following the agreement of the participants, their names and corresponding communities are registered to document the workshop.

One of the support materials provided during the workshop is the information of the steps they must take in their community to present a talk.

Home visits:

Home visits provide direct contact with families in the community. Home visits aim to carry out efforts to prevent health problems that are occurring in the area, to promote the informed, safe, and effective use of medicinal plants.

Visits can be made by a health promoter, a health worker, a community leader acquainted with community health care, or a homemaker who knows about medicinal plants in the community. Visits can include one or more homes. They can be performed by one or two persons for a short period of time not exceeding 10-15 minutes depending on the objective and topic to be discussed.



Photo: Role playing of a home visit in a TRADIF Workshop Honduras-Nicaragua. Estelí, Nicaragua.

The main resources used during the home visits are the **Caribbean Medicinal Plants** for **Primary Care** booklet, educational sheets or posters of medicinal plants and fresh plant samples to serve as reference if they are found in the home patio.

For the development of a home visit activity during a TRADIF workshop, working groups are organized. Each group is given a working guide in which a certain topic is assigned, for example: Diarrhea.

A specific period is established to implement the working guide instructions, the first one being the review of the guide, and the discussion of the assigned topic after reading the support material provided (10-15 minutes). The next step is a questions and answers session which is accomplished with the support of the facilitator (20 minutes). Roles are assigned for the home visit simulation (10 minutes), and after the group rehearsal (30 minutes), demonstration of the home visit during the plenary session is undertaken.

With the approval of the participants, the names of participants and their communities are registered as evidence of the workshop.

The following diagram shows the steps to organize and develop a **home visit** about medicinal plants:



Figure 3. Home visit diagram

Sociodrama / Community theater:

It consists of creating a performance through gestures, actions, and words with the aim of displaying analysis standards about health issues that can be resolved with medicinal plants. The situations that are shown are based on real events taking place in the



Photo: Workshop: Sociodrama design by health professionals. Santo Domingo, Dominican Republic.

community or in the location where the activity takes place. The performers belong to the community or the place where the drama is carried out which focuses in the interest according groups to the educational and health promotion message about medicinal plants that will be delivered. The sociodrama must be dynamic and preferably short. То implement this practice in a TRADIF workshop, the participants are divided in groups. Each group is given a working guide with a specific topic that will be developed, for example: flu and cough.

A specific period is established to implement the working guide instructions, the first one being the review of the guide, and the discussion of the assigned topic after reading the support material provided (10-15 minutes). The next step is a questions and answers session which is completed with the support of the facilitator (20 minutes). Roles are assigned for the sociodrama simulation (10 minutes), and after the group rehearsal (30 minutes), demonstration of the sociodrama during the plenary session is undertaken. With the approval of the participants, the names of participants and their communities are registered to document the workshop.

One of the support materials that is provided to the workshop participants is the introductory information about the steps they must take in their community to perform a community drama / sociodrama, these being:

How you organize and develop a sociodrama / community theater about medicinal plants?

We have defined six steps to develop a sociodrama or community theater. The first step is to select the topic that will be presented and establish the aim for the drama, the audience, the date, time, and place where it will be held. The second step is to develop a conversation about the topic. In this stage the performers talk about what they know about the topic, how they experience it and how they deal with it.

A third step is to develop the story or argument of the sociodrama. In this step all the facts and situations that have been exposed in the previous steps are ordered:



Photo: Health professional workshop. Santo Domingo, Dominican Republic.

- Develop the script (order of the different events or scenes)
- Define the characters in the story
- Determine who is going to represent each character
- Define when each character will perform

The fourth step is to practice the sociodrama, this can be done one or two days before its presentation. It should be noted that it must be done with all the materials that have been chosen for the performance. The next step is the presentation of the sociodrama to the target audience. The last step is to report verbally or in writing the results of the sociodrama to the person in charge.

Some recommendations to achieve a good sociodrama are to perform with a clear and strong voice and if there is a large audience, performers should talk slowly, moving and making gestures, not letting words be the only way to deliver the message in the performance. Use easy-to-find materials such as medicinal plants, hats, toys, table, and

chairs, to make acting more real and, finally use large paper signs to indicate places such as: hospital, school, home, grocery store, park, etc.

2.4 TRADIF Resources and Tools

The TRADIF dissemination resources or tools are the sources of information that organize the knowledge that is going to be communicated, they are also educational materials that contain the information that is going to be presented. These are described below:

The **Caribbean Herbal Pharmacopoeia** has three editions, the first edition was published in 1996 with 91 monographs, the second edition was published in 2004, and included 99 monographs, and the third edition collected the monographs of 130 species, with 393 significant uses that have been scientifically validated. The monographs contain information about the plant species, photographs, their scientific names, and local names with which they are recognized in the communities where its frequency of use for a particular ailment was more than 20%, and their botanical description and distribution. Regarding plant uses, each monograph includes chemical studies, biological activity, toxicity data, and the recommended dosage to treat common ailments established after analyzing the scientific studies conducted or published about the significant uses.



Figure 4: 3rd ed Caribbean Herbal Pharmacopoeia

The **Caribbean Medicinal Plants for Primary Care** booklet is recognized by the health ministries in Martinique, Cuba, and Panama as a dissemination resource for primary care. It was published in 2008. This booklet presents 38 medicinal plants species, with significant uses in 8 categories of health problems: skin, respiratory, female, digestive, eye and oral, general, and nervous. The records contain the scientific names of the species, the local name of the plant, the preparation and dosage, as well as recommendations for the preparation and use of the herbal remedy.



Figure 5: Caribbean Medicinal Plants Primary Care Booklet

The Cultivation and Conservation of Medicinal Plants Manual consists of three volumes, all of them published in Spanish. Volume I was prepared in Costa Rica and published in 2000, it contains important aspects for the conservation of medicinal plants through their propagation and presents technical files for the cultivation of 21 medicinal plants (Ocampo and Valverde 2000). Volume II was prepared in Cuba and published in 2000, it contains information on the aspects of use and availability of medicinal plants and contains the cultivation technical files for 40 medicinal plants (Fuentes et al., 2000). Volume III was prepared in the Dominican Republic, it presents aspects about the use of medicinal trees and cultivation technical files for 16 medicinal trees in the Dominican Republic (Isabeth et al, 2003).



Tomo I

Tomo II

Tomo III

Figure 6. Cultivation and Conservation of Medicinal Plants, Volumes I-III.



Posters are large-size prints used to communicate recommendations for the use of medicinal plants. This TRADIF tool was developed in Panama and published by the health ministry to disseminate TRAMIL validated uses. 22 posters were design corresponding to 22 plant species. They are posted on the walls of public places presenting information on the use of medicinal plants in a simple and clear way so that understanding is straightforward.

Figure 7. Poster Petiveria alliacea



Figure 8. Brochure printed in Panamá

Brochures are used for their convenience to disseminate information. The brochure in Figure 8 was used in Panama, to present validated information about three ways to treat diarrhea. These can be distributed in workshops or health clinics.



The **Use of Medicinal Plants Manual** describes the plant species used to treat several health problems in the Dominican Republic. It is written with a simple and clear style, is illustrated with drawings so that it is easy to understand and can be colored by participants, making its use more attractive. The information contained describes the use of plants for diarrhea, vomiting, stomach pain and bloating, and intestinal gases; liver problems, flu, cough, and tight chest; and it has a section with examples of plants that can be toxic.

Figure 9. Use of Medicinal Plants Manual cover page.

The **Game of the 7 families** was developed for a TRAMIL broadcast in Guadaloupe and is in French. The game was designed by Lucien Degras and Nathalie Belloiseaux, based on the 7 families card game for children, invented in England. For the construction of the game,

information from the Caribbean Herbal Pharmacopoeia, the Creole Phytotherapy guide, and a Creole-French dictionary, was used. 6 families were built which are related to health problems: diarrhea, fever, weakness, flu, pulmonary and rheumatism family. Each family is made up of 7 members, grandfather, grandmother, father, mother, son, daughter, and baby. Each member is named according to the local name (vernacular or common) of the plant used for the health problem in each family. For example, for the diarrhea family, the grandfather's name is "Papy" Goyave, a local name that refers to the species *Psidium guajaba* use to treat diarrhea. The card for each family includes the local and scientific names of the plant, the part of the plant that is used, the form of preparation and the amount of the plant and water used for its preparation.

Figure 10. Cards for The Game of the 7 families for the traditional use of medicinal plants



Figure 11. Postage stamps.



Medicinal plants puzzles, this is a resource that has been used more frequently for children, to provide them with information about medicinal plants in a playful way. The puzzle can be a photo or drawing that contains the use and the plant specie.

Postage stamps were issued in Dominican Republic, St. Vincent, and Barbados. Approximately 20 stamps of plant species with medicinal uses validated by TRAMIL were promoted.

A **2010 Agenda** with uses of medicinal plants, was distributed in Guadeloupe as a strategy to disseminate TRAMIL information about the validated uses of medicinal plants.

Figure 12. 2010 Agenda. Guadeloupe

Videos, about the Plants Agroecological Garden. TRAMIL Dissemination, Use of Traditional Medicine Use and of medicinal plants bv Garífuna mothers were produced. A CD-ROM of the Caribbean Herbal Pharmacopoeia (second Ed edition) 2nd was produced in Buenos Aires, Argentina (TRAMIL 2006). The CD Conservation Data Bank TR-GEF Panama



CIFLORPAN 2006 and the second edition of the Caribbean Herbal Pharmacopoeia in French (Pharmacopée Végétale Caribéenne (deuxieme edition) 2éme Ed Pointe á Pitre, Guadaloupe APLAMEDAROM, TRAMIL 2005) have been published in a digital format.

The **QR Code** is a two-dimensional image that stores or link information (simple text, web addresses, contact information, audio, or video download links) in a matrix of dots that can be read in both vertical and horizontal directions (Gómez, 2010). In TRAMIL, 364 QR



codes were created that link garden signs or demonstrative collections for TRAMIL medicinal species to the TRAMIL webpage of the monographs.

Figure 13. Aloe vera QR Code

Radio programs. In Mérida, Mexico, a sequence of 4 radio programs entitled "The power of plants" were produced to disseminate information about the TRAMIL program and the use

of scientifically validated medicinal plants. Some radio programs have also been carried out in Costa Rica.

TRAMIL articles in scientific journals, examines the uses and medicinal species reported for primary health care in Caribbean communities with an ethnobiological approach: *Ethnobotanical survey of the medicinal flora used by the Caribs of Guatemala* (Girón et al., 1991); *Medical ethnobotany survey in Martinique* (Longuefosse and Nossin, 1996); *TRAMIL ethnopharmalogical survey in Les Saintes (Guadeloupe, French West Indies): A comparative study* (Boulogne et al., 2011); *The prevalence of herbal medicine home use and concomitant use with pharmaceutical medicines in Jamaica* (Picking et al., 2011); *Medicinal plant knowledge in Caribbean Basin: a comparative study of Afrocaribbean, Amerindian and Mestizo communities* (Torres-Avilez et al., 2015); *An ethnobotanical survey of medicinal plants in Trinidad* (Clement et al., 2015); and *TRAMIL ethnomedicinal survey in Jamaica* (Picking et al., 2015).

Botanical gardens and collections play an important role in the conservation of biodiversity through their research programs, *in situ* and *ex situ* conservation, environmental education and entertainment. Given that it is difficult to cultivate all the species representing the local biodiversity, gardens establish priorities for the development of their collections, such as their scientific, ecological and / or economic value.

Medicinal plants have a cultural and ethnobotanical value. They have been an important part of humankind survival, in addition to having an economic value for the families that make use of this resource. For this reason, there are numerous **botanical gardens** in Latin America that have collections of medicinal plants. As part of the TRADIF resources, collections of TRAMIL medicinal plants have been included in existing botanical garden's collections of medicinal plants or have been established to bolster the conservation and reappraisal of the uses of medicinal plants. The significant uses of TRAMIL medicinal plants can play a convincing role in the reassessment discourse about the knowledge and use of local plants, providing greater certainty regarding the safety and efficacy of their uses.

Examples of the collections of medicinal plants in botanical gardens in countries of the Caribbean Basin are the *Agroecological Garden of Medicinal Plants* and the *Sacred Seeds Garden of Medicinal Plants* in Costa Rica, the pavilion of medicinal plants in the National Botanical Garden Dr. Rafael M. Moscoso in the Dominican Republic, the

Botanical Garden of Port-au-Prince in Haiti, the Botanical Garden of CICY, in Mexico and the TRAMIL Plant Library in the Regional Natural Park of Martinique.



Photo: Martinique Regional Natural Park collection.

Factors to consider for the establishment of a medicinal plants collection:

1) Selection of medicinal plant species, preferably starting with the medicinal plants with greater local importance in their use (review local ethnobotanical studies on medicinal plants) and if possible, including the TRAMIL species that are present in the country or territory of the Basin where the collection is intended to be established (consult the Caribbean Herbal Pharmacopoeia). However, it must be considered that many species introduced in the Caribbean Basin are valuable and beneficial. such as the food and seasoning species from other continents.

2) Search for cultivation technical files of the

selected species and conditions essential for growing, since there are herbaceous, shrub and arboreal species, and annual, biannual or perennials. TRAMIL has generated technical records for cultivation of medicinal plants in the series Cultivation and Conservation of Medicinal Plants Manual, described above (Ocampo and Valverde 2000; Fuentes et al., 2000; Isabeth et al, 2003)

3) **Assessment of the garden site** including the type of soil, type of adjacent vegetation, shaded and sunny spaces, the entrances to the place and the spaces that surround them. These aspects are not of minor importance since they will largely determine the effective growth of the species in the area and the success of the collection.

4) The **infrastructure available for the collection**, which depends largely on the infrastructure of the botanical garden where it will be established, that is, if it has an irrigation system, if there are shady areas and a nursery.

5) The **design of the collection** might be based on the species characteristics that is, whether they are herbs, shrubs, or trees. It can also be organized based on the human body systems, that is, linked to its medicinal use. As part of the collection design, all the signaling and identification elements must be considered including the road marks, signs with information about the medicinal plants, such as their uses, taxonomic identification with the scientific name and botanical family, the local name (which can vary by country and community) and characteristics of the collection. TRAMIL has the QR code of 364 species. This is important information to be included in the signs to maximize retrieval,

because by reading the code with a cell phone, visitors will access the information about significant uses available for the species on the TRAMIL website.



Figure 14. "Miguel Ángel Martínez Alfaro" medicinal plants collection design in the "Centro de Investigación Científica de Yucatán" A. C. (CICY)



Figure 15. Emergency Medicinal Plant Library design in Martinique.

Momordica charantia L. Familia: Cucurbitaceae

Cundeamor Planta medicinal para tratar afecciones cutáneas como, forúnculos y ronchas en la piel.



Figure 16. Sign for species identification including QR Code of a TRAMIL specie.

Community gardens arise from the interest of the communities due to their lack of accessibility to medicinal plants and knowledge about their use for primary health care. To establish these gardens, it is important to carry out dialogues with all the stakeholders

in the community, to determine the area where it can be established, which must be free of conflicts, and their previous knowledge about medicinal plants use in order to enrich that knowledge with the TRAMIL uses when selecting the uses and species that will make up the collection. In this way, it is expected that the community will be fully involved and committed to establish and maintain activities in the garden. The factors to consider when setting up a community garden are the same as those previously described for establishing collections in botanical gardens.

However, it is important to establish strategies for its maintenance, which will depend largely on its function; for example, if it is only a demonstration garden or will be a garden where the community will have the possibility to collect plant material. If it is only a demonstration garden, not many efforts will be added to grow and transplant new plants, but if it is going to be a garden where the medicinal plants will be collected, attention must be paid to the establishment of a nursery for stocking new plants or to create donation strategies from the people who make use of the resources, thus maintaining the dynamics of collection and propagation.

Activities in the medicinal gardens

The collections and medicinal plants gardens are the most suitable spaces to deliver workshops, trainings to different target groups or sectors of society, because these places allow direct contact with the medicinal resource and allow participants to become familiar with the characteristics of the plants to be used.

Medicinal plants first aid kit

Building a medicinal plants first aid kit supports the accessibility of plant resources for use in primary health care in specific places, such as, for example, households.

Establishing a medicinal plants first aid kit depends on the more frequent primary care needs in the household or place where it is going to be implemented. Key steps to its arrangement are described below:

1) Select the most frequent diseases or symptoms that people acknowledge.

2) Determine the place available for the kit. This is important because it will determine the species that will be selected and in turn the design of the first aid kit.

3) Select the plants to treat the identified health problems using the Caribbean Herbal Pharmacopoeia and the Caribbean Medicinal Plants for Primary Care booklet.

4) Understand the propagation and cultivation technical file of the selected plants (Ocampo and Valverde 2000; Fuentes et al., 2000; Isabeth et al, 2003)

5) Design the medicinal plants first aid kit based on the available resources.

TRAMIL Website, this site was created for the dissemination of the information that TRAMIL has produced over time and is available in Spanish, English and French. On this site you will find the history of the TRAMIL Program, as well as its mission and vision; the geographical area covered by the program (map) and the information on the uses that TRAMIL has validated for the plant species. It also contains the list of publications, TRADIF sites, surveys and scientific workshops that have been carried out in different

countries of the Caribbean Basin; and the list of "tramilers" and collaborators who contributed and contribute to the development of the program (www.tramil.net).



Figure 17. TRAMIL webpage

Chapter 3. TRADIF Experiences for Target Groups

TRAMIL dissemination has been carried out considering different target groups which represent community sectors or are groups that, due to their connection to health and / or academia, can contribute to the promotion of the informed use, safety, and efficacy of medicinal plants in Primary Health Care. The following diagram shows the target groups where TRAMIL has built capacity:



3.1 TRADIF for boys, girls, and teenagers

The dissemination of TRAMIL plants uses in this target group is carried out in a simple and participatory way, with the purpose that children and teenagers value and become familiar with the importance of the use of medicinal plants to care for their health and that of their families. Also, that they recognize that in their home and community they can count with this natural resource, creating awareness for its maintenance and preservation; through caring for the diversity of plant resources and the importance of participating in the transmission of knowledge from generation to generation.

The dissemination activities can be carried out in primary and secondary schools, or in a residence or community grounds where the participants gathered. They are led by a collaborator of the local TRAMIL Program, health professional or by a teacher or instructor. The basic materials required are local fresh plants, which can be taken by the participants. Also needed are pencils, drawing paper, cardboard and TRAMIL posters of medicinal plants, which are provided by the workshop facilitator. The dissemination
activity should last between 1 to 2 hours maximum in the case of primary school children, and in the case of adolescents no longer than 5 hours.



Photo: Outdoor TRADIF: Primary school boys and girls in Saint Lucía. 2018.



Photo: TRADIF in a primary school in Cerro, Cuba.

The number of facilitators will depend on the number of children per classroom or the number of children/ adolescents from the community.

The dissemination activities with children consist of establishing an open and participatory dialogue, about how medicinal plants are part of their environment and how they can take care of them.

From 3 to 5 medicinal plants can be selected to treat health problems they have had. For

example, for cough - oregano leaves (*Plectranthus amboinicus*), diarrhea - guava leaves (*Psidium guajava*) and for pimples, hives, or spots on the skin – bitter-melon leaves (*Momordica charantia*).

The activity is organized in three segments:

1. Introduction of the boys and girls and the facilitator, if it is not the teacher who facilitates the activity. Children can present each other in pairs for a more playful and lively activity. At this time, the topic of the activity is presented, for example: "Medicinal plants in my community."



Photo: TRADIF in a primary school in Cerro, Cuba

The dialogue continues associating Nature with medicinal plants. The facilitator asks, who can explain what a medicinal plant is? Once opinions have been given, a child is voluntarily asked to present the fresh plant s/he brought, and to share his/her knowledge about the plant: where s/he found it, which family member helped him/her get it, what parts of the plant s/he can describe, how it feels to touch the parts, are

2. The facilitator introduces the topic as a story about Nature or their culture, asking questions to be answered freely by the participants. For example: what things in Nature do you observe around you? Do you like what you see? How does what you see around you make you feel? Would you like to take care of what you have around you? How could you take care of it? From this moment on, the conversation of ideas and opinions begins.



Photo: Bitter-melon (Momordica charantia) poster.

they hard soft, thick, thin; what colors it has, what is its use, and at the end, the facilitator asks the participants if anyone knows anything else about the plant and summarizes in a simple way all the information shared.

If fresh plants are not available, we use the previously selected posters, emphasizing the photo of the plant part to be used.

To keep the boys and girl's attention and boost the activity, the group can draw pictures of the plants they are observing, or color pre-made pictures, cut the pictures, or assemble paper puzzles. This generates a lot of participation and develops a learning-by-doing gathering.

3. To assess the activity the results or products are shown, for example, the drawings or puzzles, and children are asked what they liked the most about the activity, what they liked the least and what they would like to learn and do with medicinal plants. This way the school or community can plan to follow-up their learning of the topics covered.



*Photo: Psidium guajava L.*coloring page.

what was visualized? How could they take care of it? This initiates a conversation and dialogues. At this point, special emphasis is placed on the importance of caring for the environment that surrounds us, preserving medicinal plants, and building awareness in the reappraisal of this natural and cultural heritage.

They are encouraged to exchange ideas about what they can do in their homes and in their communities to promote the care and informed use of natural resources, linked to the knowledge and use of medicinal plants.

They are shown human body systems that can be treated with plants, using anatomical drawings and the health problem, and the part of the plant use to prepare the remedy. Some important

For teenagers and / or high school students to appreciate and become familiar with the use of medicinal plants, an exercise is carried out on the perception of the resource in the environment and its individual use.

The activity is organized in three sections:

1. For the group presentation, the chairs are placed in a circle, and popular education practices can be carried out, using names of medicinal plants or fruits, popular proverbs, or a presentation in pairs practice. The topic is presented, for example: "Medicinal plants, a cultural value to preserve."

2. For the development of the theme, the participants are asked to close their eyes for three to five minutes, breathing gently, slowly and begin to imagine Nature with all the elements that they can recall. Then they are asked to open their eyes slowly and described freely what they visualized. They are asked questions like what they visualized? If they like their visualization? How does it make them feel? If they would like to keep



Picture: Human body organs drawing.

medicinal plants and ailments to highlight to teenagers, being their more frequent complaints, are chamomile flowers (*Matricaria recutita*) for menstrual pain and linden leaves (*Justicia pectoralis*) for nerves.

It is appropriate to ask participants to bring medicinal plants to the workshop. They will show the fresh plants to the group either in pairs or small groups, or the drawings made

during the workshop while describing the plant, its use and why taking care of the plant is important.

To stimulate the group, animation games can be played in which the teenagers can exchange a fun and learning moment about medicinal plants.

3. Assessment of the activity is accomplished asking the participants to talk spontaneously about what they learned and what other topics they would like to know in future activities organized by the school or the community. In some cases, the work done in one class is presented to the school



Photo: TRADIF for teenagers in a high school in Cartagena, Colombia. 2012.

and a photographic recollection of the meeting is kept as record.

Medicinal plants contests are another way to disseminate the use of medicinal plants in schools. Their purpose is to promote the informed and sustainable use of medicinal plants to solve basic health problems. Some contest examples include narration, oratory, poetry, and painting, among others.

The contest's guidelines, its closing date and prizes are established. In the guidelines the medicinal plants of interest are defined. The criteria for their selection may vary and can include plants most known in the community, plants threatened by their loss in the region or plants with TRAMIL uses. Based on the criteria of greatest interest, the participants select the plant(s) to participate in the contest.



Photo: Medicinal plants contest in a primary school in Habana, Cuba. 2005



Photo: Proud kid showing his medicinal plants garden in El Guásimo community, Costa abajo de Colón, Panamá.

An important aspect is to enhance and sustain medicinal plants knowledge in the new generations, promoting gardening in their backyards, motivating them to create their medicinal plants garden or a medicinal plants first aid kit, through the exchange of fresh plants between friends and neighbors, helping to keep the medicinal plants resource at hand, to prevent common diseases, to protect them and make informed use of them.

The medicinal plants that are grown are those obtained from these exchanges, personal preferences, as well as the TRAMIL plants identified in the workshops. In this way accountability among the teenagers is promoted in function of the collective good and love for Nature.

3.2 TRADIF for youngsters with special needs

This target group results from "tramilers" dissemination experience in Cuba coordinated with the Central Laboratory of Pharmacology in Havana, to show young people the usefulness of medicinal plants for their health and that of their family, alert them of the importance of preserving medicinal plants, promote and stimulate their creativity and development of hands-on skills using different plant parts in their creations.

The activities were developed with the support of special education teachers. Activities include medicinal plants drawing, painting, crafts contests, where the abundance of creativity and exchange of talents among the participants can be valued.

The contest concludes with a crafts exhibition and the awarding of winners. Some examples are shown below:



Nivel I Alum no: Arsenio Sánche Fritero: Caco Saco y bribrit iresporma y Samillas Je aji

Photo: Medicinal plants mini garden.

Photo: Dry coconut and seeds fruit platter.



Photo: Closing activity. First Medicinal Plants Contest in Habana, Cuba.



3.3 TRADIF for Homemakers

A critical support for dissemination, homemakers, provided mostly all the information collected in the ethnopharmacological surveys. Thus, the TRADIF workshops for them are developed to carry out an open restitution of the information provided, and at the same time to provide them with medicinal plants and health education dissemination tools for their communities.

Photo: Crafts exhibit. First Medicinal Plants Contest in Habana, Cuba. Two important facts are the starting point in the workshops for this target group: the most frequent health problems in the community and the uses of plant parts that were significant (> 20%) in the surveys.

The workshop is led by a TRAMIL Program member, joined, if possible, by other collaborators such as botanists, nurses, and doctors. It can take place outdoors in the backyard of a house, or in a local community center. Its length is 4.8 to 24 hours. The minimum materials required are fresh plants of selected species, the Caribbean Medicinal Plants for Primary Care booklet, posters of medicinal plants, utensils to carry out a hands-on class about the form of preparation of medicinal plants remedies (water, stove, pots, strainer, knife, table to chop plants, spoon, cups) or other materials according to the dissemination techniques defined for each workshop.



Photo: Homemakers TRADIF workshop sharing information about bittermelon (Momordica charantia). Zambrana, Dominican Republic.

The workshop takes place in three segments:

participants and the facilitator 1. The introduced themselves stating their names, place of origin and the expectations they have about the workshop or through the set-up of introduction in pairs and at the end use labels with presentation the information presented. This segment concludes explaining the workshop's objectives and a summary of the expectations set forth, which will serve during the assessment.

2. In this segment the workshop is developed. Implementation is lively, valuable with the details of traditional knowledge and

community shared experiences.

The survey results, the significant uses in the community and the parts of the plants used are presented and a conversation with the homemakers is started on the uses of plants according to health problems affecting an organ or body system. This includes describing, in their words, the medicinal plant of interest, how they know it, through whom, for what condition they use it, where they get it, if it is difficult to find it or not. Involvement is open, and spontaneous, and results in the group development of the history of the plant including the research results and how the natural resource can be well-preserved and reappraised.



Photo: TRADIF workshop with garifuna homemakers watching a video., Honduras

Then, there is a conversation about experiences on the use of medicinal plants in other countries. Audiovisual media such as videos that show TRADIF experiences in other Caribbean communities are used as a resource, followed by a question-and-answer session.

Videos and pictures showing home hygiene practices are used to address health problems, to focus on the preventive aspect of human health and to show microorganisms causing infections and how and where these health problems develop?

It is important to note that while the health problem is addressed, parts of the medicinal plants used are presented. The number of uses and species to include in the workshop depends on the time available and can vary between ten and fifteen hours.

Then the group proceeds to practice the preparation of herbal remedies. The groups are



Photo: TRADIF workshop with homemakers explaining the preparation of an infusion with leaves. Zambrana, República Dominicana.

organized so that a form of preparation: infusion, decoction, poultice or plaster and baths and one plant are assigned to each one. The TRADIF booklet or posters can be distributed as guides and the groups carry out the preparation of their corresponding remedy in the plenary session.

The resources available in the community such as a stove and small utensil, pots with lid, spoons, strainer, etc. are used to complete the practice.

When carrying out the demonstrations, emphasis is placed on how an infusion is made with soft parts and a decoction with hard plant parts, to the importance of using the required quantity of herbs, a covered container, and clean procedures when making and applying the remedy. During the preparations, general recommendations are given such as: washing the plant parts to be used with clean water, not using leaves with

insect bites, washing the area before applying a poultice, suspending an application if the skin turns red, as well as the importance of going to a clinic if the condition does not improve.

Carrying out diffusion and education activities in an attractive way such as community theater or sociodrama is important. The sociodrama is carried out by a group and can be presented in the neighborhood or the community, it is produced with items that the participants share to stage their representation, the topic can be a health problem and how to treat it with medicinal plants. This activity also develops the creativity and initiative of the participants.



Photo: Community theater with homemakers from La Chorrera ward in Santo Domingo, Dominican Republic.

3. During the workshop evaluation the participants are sited in a circle, and they proceed to discuss whether their expectations were met or not, what part of the workshop seemed most useful and what topic they would like to address in the future.

3.4 TRADIF for senior citizens

This target group results from a dissemination experience in La Havana with the



Grandparent's Circle, carried out by TRAMIL members in Cuba in coordination with the Central Laboratory of Pharmacology from that municipality.

This experience is part of an initiative to reappraise the medicinal plant as a resource in health prevention for the elderly, strengthening primary health care in this age group of the population.

Photo: Members of the Grandparent's Circle in La Lisa, La Habana, Cuba.

Activities to raise awareness and advise about medicinal plants are different from educational and dissemination workshops about medicinal plant's safety and efficacy and their use in common conditions such as flu, cough, diarrhea, dyspepsia (heartburn), weakness, sleep disorder and nervous tension, among others.

Awareness raising activities are planned for the identification and direct contact with medicinal plants. For this, small tours are offered around a courtyard or area of the community where plants are found, and seniors can observe the medicinal plants among them. Once they discovered the plants, the participants share the information they know about them in groups, for example: the name of the plant, for what health problem they use it, how they prepare it and where they can find it.



Photo: A grandmother sharing information about a medicinal plant found during the walking tour.

Photo: Members of the Grandparent's Circle cleaning the land to grow medicinal plants in La Lisa.



Another activity to raise awareness and contact with medicinal plants is to promote a medicinal garden in the place where the grandparents' circle works and / or in their home. The project starts with cleaning and preparing the place to establish a small garden of medicinal plants that also will preserve the resource and promote physical activity among the elderly.



Among the educational activities, the talks given by collaborators of the TRAMIL program, highlights the informed use of medicinal plants, the safety and efficacy in their use, as well as creates awareness about their worth and the importance of their conservation.

A component of dissemination activities is the promotion of declamation, storytelling, painting, drawing, poetry, and crafts contests about medicinal plants.

Foto: Universidad del adulto mayor La Lisa. La Habana, Cuba.

3.5 TRADIF for health professionals

The objective to approach this target group is to familiarize and bring the health professionals closer to the use of medicinal plants in their healthcare practice, in accordance with the primary care groups defined in TRADIF (Figure 19). The health professionals that make up this target group are general practitioners, graduate nurses, nursing and health assistants, health technicians, as well as environmental health technicians, rural health assistants and health promoters.

Eyes, ears, Respiratory Digestive Urinary nose, throat Cold Diarrhea Kidney pain Conjunctivitis Flu Vomiting Edema / Throat pain Cold Colic Inflammation Toothache Cough Stomach ache Diuretic Oral Asthma Gas candidiasis Pneumopathy Indigestion Worms Constipation Female Skin Nervous General Menstrual Cuts and Insomnia Fever delay scratches Weakness Anxiety Vaginal Pimples Nerves Pain discharge Fungus Jaundice Blisters Skin ulcer Baldness Mild burns

The Primary Health Care groups defined in TRADIF are:

Figure 19. Primary Health Care groups treated with medicinal plants. Source: Caribbean Medicinal Plants Primary Care booklet

3.5.1 General practitioners, nurses, nursing and health assistants, health technicians

A workshop for health professionals should include topics such as: introductory traditional medicine, basic elements of botany, introduction to herbal medicine, toxicity of medicinal plant parts, and the Caribbean Herbal Pharmacopoeia.



Photo: Workshop for nurses using the Caribbean Herbal Pharmacopoeia. Honduras.

The health problems that will be discussed in the workshops must be defined. A prior selection is made according to the prevalent diseases in the municipality where the workshop will be held, so that participants can relate the usefulness of the medicinal plant resource to the local health needs.

Once selected, posters or presentations are prepared with the information obtained

from the monographs in the Caribbean Herbal Pharmacopoeia that contains the scientific validated uses for the selected health problems. An example for the presentation of the validated uses is the organization established by the National Commission for the Use of Medicinal Plants of Venezuela (CONAPLAMED), which illustrates how to use plant's parts and the relationship of their efficacy and safety criteria with the results of studies contained in the monographs of the Caribbean Herbal Pharmacopoeia. This way health professionals can establish the scientific source of the validated use. *An example of a CONAPLAMED record for respiratory problems is*:

USO TRADICIONAL Y PREPARACION	CRITERIOS DE EFICACIA	CRITERIOS DE SEGURIDAD
EUCALIPTO HO – DEC – VO HO – INF – INH HO – DEC – INH Prefiriendo la via inhalatoria a la via oral se recomienda: 1. Para hoja seca (infusión): verter 1 litro de agua hirviente sobre 2 - 3 cucharadas soperas (8 – 10 g) de hojas secas. 2. Para hoja fresca (decocción): agregar de 30–40 g de hojas por litro de agua hirviente, permitir que la acción de la fuente de calor actúe directamente sobre la preparación hasta la aparición de un olor característico. Retirar del fuego 2 minutos después. La preparación obtenida por cualquier de los dos procedimientos anteriores se inhala debajo de una toalla que permite dirigir el vapor de la preparación,	El cacaliptol $(1, 8 - cincol)$ contenido en el accite esencial en una concentración de 70 a 80%, es antiséptico. (2) Nota: La concentración en aceite esencial es mayor en las hojas adultas de tallos ya lignificados. El espectro antibacteriano es mayor para los Gram (+) tales como Staphylococcus aureus, Neumococo, Bacillus subtilis, y frente a Gram (-) solamente hay actividad contra <i>E.coli</i> . (3) También se ha demostrado en estudios <i>in vitro</i> una actividad antiviral del preparado de hoja de <i>eucalipto</i> frente a <i>Influenza</i> <i>A</i> por las fracciones <i>quercitina</i> e hiperósido. (4) Es además expectorante. (5) una ción, (1) Eucaliptol (1,8-Cineol) Mentol Camphor (Alcanfor)	 La DL 50 del aceite esencial en el ratón, via ora es superior a 5 g/kg (7) La ingestión de 4 a 24 ml. de aceite esencia generalmente causa irritación intestinal, nausea y sobre todo puede ser fatal por depresiór respiratoria. (6) La dosis en la preparación tradicional no se acerca a estas cifras y es por lo general muy bien tolerada en adultos. El aceite esencial puede aumentar las secreciones traqueo bronquiales y favorecer el broncoespasmo, por lo que no debe indicarse en niños asmáticos.
The state of agonamiento de la fragancia caracteristica. (1) FOTO: MAZZATI Ce plante audiquele. Gude Ver Nº 12 FOTO: MAZZATI Ce plante audiquele. Gude Ver Nº 12		 REFERENCIAS BIBLIOGRAFICAS (1) CARBALLO A. (1995). Calcula de concentración y dosis de las drogas vegetales TRIMIL: Mensuraciones farmacognósticas y aproximaciones técnico – clínicas – in Farmacopea Carbien 1º edic. Enda Carbe p 147. (2) PARIS R. MOYSE H. (1981). Précis de Matiére Médicale. Ed. Maioine. (3) YOUSEF R. (1980). Pharmazie, Vol 35 (H): N° 11 pp 698. (4) VICHKANOVA S. (1973). Chem. Abstr. N° 70 pp 728. (5) NEGWER M. (1987). Organic chemical drags and their ynonyms. 6° Ed. Berlin: Akademie Verlag. 182: 1406 pp. (6) DUKE J. (1988). Handbook of Medicinal Herbs Boca Batón, Florida, CRC Press 677 pp. (7) ROBINEAU. (1996). Farmacopea Caribeña lera. edic. Enda Caribe p 146.

Photo: Clinical Phytotherapy Notebook for Respiratory and Digestive Problems. CONAPLAMED, 2000.



Photo: TRADIF Venezuela 2019

simulations In case health problems that are seeing daily in the medical consultation or community work carried out by the nursing staff, assistants, and health technicians are resolved. These problems are presented in the form of "clinical cases" described in a simple way, with names of local or fictitious characters that must be "solved" in small groups and discussed in the plenary session of the workshops.

The development of the technique is carried out in small groups using a guide organized by body systems or organs. One group is assigned to solve problems related to a system or organ, for example: skin. The guide for skin problems contains 2-3 clinical cases to be treated with medicinal plants such as interdigital mycosis, mild burn, furunculosis-pimples.

In each case to be solved, questions are included that the group must answer, present to the plenary session, and discussed collectively.

An example of a clinical case for skin conditions follows: *José is a 20-year-old guy*

that works in the fields, near a water hole. He wears rubber boots to work. For 5 days he has felt a lot of itching between his toes and reports bad smell. He has noticed a white film that peels off. His toes itch more at night, sometimes he scratches because he can't stand it.

- What health problem does José has?
- What part of the medicinal plant would you recommend? How would you prepare the herbal remedy? What dosage and frequency of treatment would you recommend?
- What additional recommendations would you give José?

The principal resources that we use for this practice are the medicinal plant's monographs in the Caribbean Herbal Pharmacopoeia and the Caribbean Medicinal Plants for Primary Care booklet.

Photo: Case simulation working group. Nurses. Honduras.



The answers sheet to the "case simulations" questions are set while the cases are developed and is use by the workshop facilitator to manage the plenary session. The duration of this practice is 30-45 minutes, The time for groups discussions and the plenary are based on the number of groups organized in the workshop. The workshop includes sessions to prepare remedies, short talks, home visits and hands-on plenary sessions, among others.

3.5.2 TRADIF for Environmental Health Technician, Rural Health Assistant and Health Promoter

These health workers correspond to people involved in community work, either as promoters, brigade members, or personnel who work in health units carrying out activities related to the environment, or diseases transmitted by vectors.

The dissemination activities are intended to provide them basic knowledge about the safe and effective use of medicinal plants, allowing them to promote their use in the communities, using popular education tools to stimulate and reappraise the local plants in community health care. There are four main topics in capacity building around this group:

- Introduction to medicinal plants knowledge
- The human body and health problems
- Safe and effective use of medicinal plants
- Dissemination tools in the communities

Introduction to medicinal plants knowledge

This topic is developed with animated and hands-on techniques with members of the local TRAMIL program in academia, as well as local NGOs, so that a conversation is started that allows for the involvement and collaboration of local stakeholders.

An important exercise is the exchange of information about the medicinal plants in the community. Each participant must describe a plant that will be included in the workshop so that collectively the knowledge is built about the principal characteristics of each plant such as color, smell, taste, form, part(s) used, preparation of remedies and for what health problems are useful.

Questions about What is a medicinal plant? What is an active principle? Toxic uses of some plants, factors that interfere with the quality of the plants and others are discussed. This activity can be enriched by visiting local laboratories that work with medicinal plants, where the group can learn about the manufacturing processes with natural products and with the safety and efficacy of their use.



Foto: Taller promotores de Salud. Panamá

body anatomy by organ or system. Open questions are used while developing each topic, for example: what is the respiratory system? what are its parts? what is its function? what ailments they know, that affect this system? While answers are proposed, a

The human body and health problems

In this group, it is extremely important to reinforce the basic knowledge in the human



Photo: Respiratory system anatomy. Workshop for Environmental Health technicians. Honduras 2004

participant can write them down on a flip chart and when answers are finalized, the facilitator uses body diagrams to illustrate and summarize the knowledge gathered collectively.

Health problems are described by organ / system (Figure 19). Videos are used to illustrate warnings and symptoms of diseases and its alarm signs, for example for respiratory diseases and diarrhea. Once each video is finished, a questions, answers and opinion session are held about the observations, a brief discussion about the healthy-sanitary practices is supported, and environmental factors, among others, that can contribute to the incidence of the disease are discussed.

Safe and effective use of medicinal plants

This topic illustrates the forms of preparation of herbal remedies such as preparing infusions with soft parts of the plant (mature or tender leaves, flowers), decoctions with hard parts (barks, roots, rhizome, seeds) and poultices or plasters. Facts such as covering pots with lids when boiling herbs, straining herbs, and following the recommended boiling time, and good practices are mentioned. Emphasis is placed in the importance of using sanitary practices during the preparation and



Photo: Video about acute diarrhea case. Binational Workshop Honduras-Nicaragua. Estelí, Nicaragua, 2004



Photo: Practical class: forms of preparation of medicinal plants remedies. Health promoters' workshop in Panamá 2005

An important and inspiring gathering takes place when experiences from health workers from different countries are shared. This happened during the binational workshop Honduras-Nicaragua, which included environmental health technicians, health promoters and community leaders. In the workshop, the cultural aspects involved, the limitations found in their work, as well as successful actions in both countries to encourage the reappraisal of the medicinal plants as a health resource were discussed.

application of the remedy in case it is used topically. During this activity the Caribbean Medicinal Plants for Primary Care booklet and educational posters are the main tools used.

Community-based difussion tools

Developing educational activities such as sociodrama / community theater, talks and / or home visits (see Chapter 2), workshop's participants are shown the community-based tools for the medicinal plants use promotion and dissemination.



Photo: Plenary session at the Binational Workshop Honduras-Nicaragua in Estelí, Nicaragua. 2004

3.6 TRADIF in Universities

TRADIF efforts towards technical and higher education authorities in health careers are aimed to show them the importance of incorporating in the university curriculum the topic *"safe and effective use of medicinal plants"*, as well as to inform them how to support their human resources training, with the Caribbean Herbal Pharmacopoeia as a scientific source.



A diagram of the main stakeholders in this target group is shown below:

Figure 20. TRAMIL Dissemination in Universities

3.6.1 The Caribbean Herbal Pharmacopoeia in Higher Education

As part of the follow-up to the Panama recommendations, a portfolio with information related to the training of human resources in Phytotherapy in Central America and the Caribbean was completed. It was found that several higher education institutions including Cuba, Guatemala, Nicaragua, and Guyana had programs related to the topic.

This effort was accompanied by meetings with leaders and medicine, nursing, pharmacy, and biology faculties from state and private universities in Honduras, Nicaragua, and the Dominican Republic. Also, the PAHO / WHO offices in those countries were approached, to know and discussed their opinions, suggestions, and recommendations, as well as to develop joint actions with universities and Ministries of Health to include Phytotherapy in the higher education curricula. The consultation process resulted in a proposal of academic approaches that could be implemented for the inclusion of scientifically validated uses / part of medicinal plants in the curricula of health-related careers.

A Medical Phytotherapy Program was also proposed for 6th year medicine and / or 5th year nursing students. The proposal includes basic information about the program, list of modules to be developed and the description of the academic program. The Caribbean Herbal Pharmacopoeia was used as the main source of scientific evidence.

3.6.2 TRADIF for faculty in health-related careers

The aim is to approach and sensitize faculty in health-related careers and to promote training programs related to the use / part of scientifically validated medicinal plants. It also foresees the involvement of faculty from the TRAMIL Program in the dissemination process, both in higher education and communities.

Dissemination has been carried out through courses, workshops, and seminars. Most of the participants have been women from the medical sciences programs with more than 80% indicating no prior training in the subject.

Topics covered in the workshops are established according to the main health problems in the region and the specific interests of each university. Issues such as traditionscience, research-action, health and interculturality can be integrated.

The workload varies from 8 to 40 hours and in some cases, such as graduate degrees, may last longer. The average number of faculty in each activity varies between 25 and 30 persons.

An important approach for this target group is to disclose the TRAMIL Program scientific research methodology and to display the Caribbean Herbal Pharmacopoeia as a scientific

source which can be used by faculty, researchers, and health care providers, to learn the safe and effective use of part / s of medicinal plants and the uses that are not recommended due to their risk of toxicity.

Some examples of dissemination faculty experiences with are those developed Nicaragua with in the collaboration of TRAMIL Venezuela in 1999, involving faculty from medicine, dentistry, pharmacy, nursing, and biology. Likewise, in 2001 in Haiti, medicine, and



Photo: TRAMIL Medicinal plants course in Habana, Cuba, 2005.

pharmacy faculty from the Université d'État d' Haïti (UEH) was trained. Also, during 2003-2005 more than 150 faculty from health-related careers in state universities from Guatemala, Honduras, Nicaragua, and Costa Rica were trained. In 2005, in Havana, Cuba, 175 faculty were trained in TRAMIL medicinal plants with the coordination of the Pharmacology Central Laboratory from the Salvador Allende Medical Sciences Faculty.



Photo: University of the Antilles (UA) Faculty and NGO Representatives. Guadeloupe, 2009.

NGOs developing health programs in Guadeloupe, have participated in dissemination workshops involving faculty. Members from TRAMIL Martinique have also attended these trainings. The Faculty of Pharmaceutical Sciences at the University of Cartagena, Colombia, promotes for faculty and students, a cycle of scientific conferences related to Caribbean ethnopharmacology and Ethnocultural Encounters.

Likewise, members of the TRAMIL Program have train faculty and students from the Faculty of Biology at the National Autonomous University of Nicaragua in UNAN-León, in the preservation of TRAMIL plants.



Faculty from the University of Puerto Rico in Cayey conducted a conducting ethnopharmacological survey, and TRAMIL dissemination workshop among health professional, surveyed communities and public. For each category of workshop, instruments were designed including a test on the use of medicinal plants by the participants.

The multidisciplinary and interinstitutional components aimed at faculty capacity building has been fundamental for dissemination at this level. The support of the Botanical Garden of Santo Domingo, for example, with experts in botany and



Photo: Poster promoting Ethnopharmacolofy Conferences in Cartagena, Colombia, 2017

Photo: Conference: "Preservation of TRAMIL medicinal plants: a contribution to the global strategy implemented for the herbal resource's conservation". UNAN-León, Nicaragua.



Photo: TRADIF at the University of Puerto Rico. Cayey, 2011

taxonomy, members of the TRAMIL Program, has been noteworthy.

In addition, the participation of the universities has been decisive for the publication of a university edition of the Caribbean Herbal Pharmacopoeia by the National Autonomous University of Nicaragua UNAN-León and the University of Cartagena, Colombia.



Photo: Working session at the botanical garden in Dominican Republic.

3.6.3 TRADIF for students in health-related careers

An important effort has been to bring university students in medical sciences and health careers such as nursing, chemistry, pharmacy, and biology, closer to the scientifically validated uses / plant parts of medicinal plants, through seminars, workshops, and courses.

The topic covered refer to the research methodology of the TRAMIL Program and the presentation of the Caribbean Herbal Pharmacopoeia as a scientific source that can be used for research purposes and in their professional practice. Special emphasis is placed on the uses that are not recommended due to the risk of toxicity.

Well-designed dissemination activities are developed using different techniques such as teamwork where the importance of the Caribbean Herbal Pharmacopoeia, its structure and how to use it for informational and research purposes, or for the use of medicinal plants are considered.

Hands-on classes are offered on how to prepare remedies based on medicinal plants such as infusions, decoctions, poultices, or plasters. Students proceed to prepare the remedy and explain their preparation and dosage. Once the treatment for a certain health problem is presented, a question-and-answer session is organized resuming what has been presented

An important aspect that is promoted among students is the reappraisal of the medicinal plants as a natural resource, its informed use and conservation. For this, medicinal plants posters exhibits are promoted during scientific conferences organized at the universities, as those held in Port-au-Prince, Haiti and in Cartagena, Colombia.



Photos: Posters exhibit. Medicinal plants scientific conference. Haití, 2013.



Photos: Scientific conference at the University of Cartagena, Colombia.

Cuban dissemination among students has impacted 475 medical students from the Salvador Allende Faculty. Trainings have been developed following three curricula: *voluntary time with students, student research in medicinal plants and TRAMIL Medicinal Plants Course* for master's degree students in bioenergetic and natural medicine.

It should be noted that the TRADIF program and its main subject "the scientifically validated uses of medicinal plants" has surpassed the borders of the Caribbean Basin. Universities in Bangalore-India, Nairobi-Kenya, Metz-France, and La Matanza-Argentina have included this topic in their academic activities.

Faculty and students in health-related careers from universities and technical institutes in which capacities in the medicinal plants uses / plant parts scientifically validated using the Caribbean Herbal Pharmacopoeia as a scientific source have been developed, come from Guadaloupe and Martinique, Jamaica, Trinidad and Tobago, Haiti, Puerto Rico,

Cuba, Colombia, Argentina, Guatemala, Honduras, Nicaragua, Costa Rica, and the Dominican Republic.

3.7 TRADIF for the Scientific Comunity

In this target group, dissemination is based in the research results contained in the Caribbean Herbal Pharmacopoeia and the peer review research from members of the TRAMIL Program, as a source available to researchers (phytochemists, pharmacologists, toxicologists, physicians, biologists, ethnobotanists), research centers, ministries of health and universities. It is also aimed to institutions related to medicinal plants such as herbariums, the Ministries of Agriculture and the Environment, and other governmental agencies.



Figure 21. Dissemination in the Scientific Community.

Figure 22 shows the dissemination modalities of the research methodologies contained in the Caribbean Herbal Pharmacopoeia.



Figure 22. Dissemination Modalities in the Scientific Community.



Photo: Saber Curar VI poster. Sto. Domingo, Dominican Republic, 2003.

National meetings: these meetings known as "Know How to Heal" focus on health and traditional medicine issues. Their objective is to promote the conversation of scientific knowledge, conservation and management of medicinal plants used in Primary Health Care among health promoters, specialized medical personnel, NGOs, ministry of health representatives, botanical gardens experts and PAHO / WHO local leaders. They include activities such as

workshops on the Photo: First National Symposium on of medicinal use hands-on plants. workshops about forms of preparation of medicinal plants remedies. cultural events. alternative and complementary therapies

workshops,

allowing a holistic

approach to health care. These meetings have contributed to the dissemination and reappraisal of popular medicine.

Symposia: they allowed experts to come together to present and develop a topic of interest, from different perspectives through specific, brief, and constant interventions. An example of this event is the forum

Traditional Medicine. Nicaragua 2003.



"Medicinal Plants in Primary Health Care", held in Nicaragua, with the participation of universities, leaders of indigenous peoples, spokespersons from different departments of the Ministry of Health, the Nicaraguan Network of Traditional Health Systems with Medicinal Plants and Other Alternatives (PLAMOTANIC) and the local PAHO / WHO office.



Photo: Conference: TRAMIL Program Update. Rosario, Argentina 2013.



Photo: Scientific Conference at UNAH. Tegucigalpa, Honduras 2004.

Scientific conferences: these are meetings where faculty, students, national international experts. update and information, present research results and discuss experiences. Example of a scientific conference held at the National Autonomous University in Honduras was

"Medicinal plants: a valuable resource to preserve", where lectures, forums, workshops, and poster exhibits were held by students.

National and international Meetings: where TRAMIL members have participated presenting TRAMIL research methodology, the Caribbean Herbal Pharmacopoeia research results, multidisciplinary and inter-institutional work, among other experiences, allowing the move beyond disciplines among participants. One of these meetings, the First Latin American Congress of medicinal plants, was held in Rosario, Argentina in 2013.

Publication of scientific TRAMIL research articles: by members of the TRAMIL Program, is a fundamental component in the dissemination that is carried out. Below are some examples that account for research in ethnobotanical/ethnopharmacological, phytochemical, pharmacological and toxicity of medicinal plants that supports TRAMIL research results: Alvarado-Guzmán et al. 2009, Boulogne et al. 2011, Clement et al. 2015, Girón et al. 1991, Longuefosse and Nossin 1996, Picking et al. 2011, Torres-Avilez et al. 2015 and Weniger, B. 1991, among others.

Dissemination in this category is represented also by the publication of TRAMIL articles in magazines or bulletins of wide dissemination in which work carried out in the Caribbean

Photo: TRAMIL Newsletter.



camo y un apoya importante en la carección primeria de solud da la publicación. Los Ministerias de Solud y las internedidades de la provinción han antieterios las terraismentes constructos, en la de llagar a acuadade giordes poro el aprovechamiento decuada o la su platar melicificate camilitamente validadas y a la aranneción e aditar as incluidas y a la incorpora en ela terraiso protos providos y a la submección RAMI (Programo de investiganation Centritara Aplicación y Uso Ropular de Flantes Macianalos una Claribe), com

sa I 3 dade experience, he recorduo la se alluera de formetingadore e instruccióned que introdyne nel e campo de la plantar senciencias de Cantoron etco y coltes hajor un enlocar unitidióphino t. Canado en la planta senciencia de la plantar senciencia de la información en enclanda en includanza, la interficioada de os especies, lo centralos nel ministra, succiolaçãos y formacrofegens de las plantas muiticades fantados y de fisicioa de la información en comunadade, forman protecien la balar sen una la construfica de la construcción de la construcción de la construcción de la construcción de la construfica de la construcción de la construcción de la construcción de la construcción de la construhade, fanda (construcción de la construcción de la construcción de la construcción de la construhade), fanda (construcción de la construcción de la construcción de la construcción de la construcción de la construhade), fanda (construcción de la construcción de la construcción de la construcción de la construhade), fanda (construcción de la construcción de la con

E constante habiço de 176AML desés su laticas en 1982 y la unión de su catabandores anacidados de a Infra comin la bullinación de las plantes materialandes bajo atrativos contificos de agruptidad y eficios(s, son las principales formiseus de este programa qua la pamilitía a su catabanadores lagar al otro 2000 con un enfoque de trabajo unificado, dentra de las nuevas inicialhes de trabajo confunto. Basin is described, for example, the Latin American and Caribbean Bulletin of Medicinal and Aromatic Plants and the Réseau Médicaments and Développement and Dialogues entre Méd.

The TRAMIL Program has also published a newsletter, to report dissemination activities as well as the results of surveys and research work carried out by members of the Program. In addition, TRAMIL has developed a knowledgebased webpage about the Programs's activities and Caribbean medicinal plants as a dissemination tool available to all users interested in the subject (http://tramil.net/).

Likewise, the Virtual Health Library (VHL) / Traditional, Complementary and Integrative Medicines in the Americas (MTCI) has full texts of thirty publications in scientific journals that include TRAMIL as a source:

https://pesquisa.bvsalud.org/mtci/?lang=es&ho me_url=https%3A%2F%2Fmtci.bvsalud.org&ho me_text=BVS+MTCI&q=Tramil&submit=Buscar

Chapter 4. TRADIF Assessment

TRADIF Assessment efforts have been less frequent when compared to the resources devoted to dissemination, because they are influenced by the constancy or irregularity of "tramilers" or the personnel carrying out TRADIF actions, to follow up and give permanence to the activities developed, ensuring a continuous process with time.

Although we cannot report a global and systematic TRADIF evaluation, efforts have been made as "tramilers" initiatives in some territories, providing interesting information that highlights the importance of carrying out evaluations. These have been developed in four directions that contribute to the enrichment of strategies to carry out TRADIF activities:

1. Evaluation of the information returned to the surveyed communities and the communication methods employed.

- 2. Evaluation about the use of the acquired knowledge.
- 3. Evaluation of the information gained in a course/workshop.
- 4. Self-evaluation for the TRADIF advancement.

Evaluation of the information returned to the surveyed communities and the communication methods employed.

In the beginning of the TRAMIL Program, an opinion survey was carried out among participants in the restitution workshops, to evaluate their opinion regarding TRAMIL applied research. In their answers, the greatest interest was not about the results obtained, but in the "new data", and "new plants", about plants with significant uses from other territories and their accessibility in their area. This reply made possible with time to spread out and share information and exchange experiences between nearby territories.

In 2001 in Haiti, the role of the media in dissemination was evaluated. The instrument used was a questionnaire addressed to peasants from the surveyed communities. The survey results showed that person to person communication, was the most accepted communication approach by the people consulted. This confirms that this form of communication should continue to be implemented in trainings, particularly in areas with low literacy.

About the observations on the printed educational material released during TRADIF in communities from the Dominican Republic, the participants showed great interest in the manuals presenting the use of medicinal plants to treat flu, cough, cold, diarrhea, stomach pain, bloating, as well as toxic uses that are not recommended. This confirms that the use of printed materials during their trainings is well received.

In Panama a full color brochure, using smooth drawing techniques for easy interpretation was endorsed by the community in 2001. They were designed to be understood by illiterate people showing the procedure for the preparation and proper use of medicinal plants remedies. The brochure verification was performed by personnel from the ministry of health and faculty from the University of Panama.

Evaluation of the use of the acquired knowledge

The evaluation of the impact of dissemination on the use of medicinal plants in the surveyed communities was initiated in Cuba, through surveys conducted to find out the participant's previous knowledge on the use of medicinal plants, the uses applied after receiving the training and the medicinal plants cultivated for medicinal use after the training. The survey included general data about the person surveyed, a brief characterization of the family, their opinion about the training, and their suggestions for improvement. This survey is an interesting initiative that should be repeated in other territories.

Evaluation of the information gained in the course or workshop

This standard is the most implemented to date, it includes qualitative aspects related to the opinion about the use of medicinal plants in primary health care, and quantitative aspects related to knowledge gain, through the application of initial and final diagnostic tests to all the participants. This standard also includes the evaluation of the dissemination activity.

The **qualitative** aspect has been implemented asking questions about the opinion of the participants regarding the use of medicinal plants before and after each dissemination activity. This assessment has included workshop participants such as housewives, health promoters, health professionals, health school's teachers and students, as well as public.

In Puerto Rico, some health professional's responses were:

- "Conventional medicine can be complemented with alternative medicine to provide better service to patients".
- "The findings of professionals in the TRAMIL program who study plants can be promoted through different means".
- "Information can be delivered to staff and patients on the subject".
- "Patients suffering from diseases can be informed, how to prevent them".

In the communities, they mentioned that:

- "With the booklet you can explain to family members and increase the level of confidence when using them".
- "What I liked the most was knowing about the studies that corroborate the efficacy of plants".

The more significant topics were those related to traditional uses and the preparation of botanical medicines.

When we asked health career faculty in Honduras, Nicaragua and Dominican Republic, their opinion on the use of medicinal plants at the beginning of the activities, they replied that:

- "[medicinal plants] preserves popular tradition".
- "Its [plants] uses must have scientific validation".
- "Its [plants] use in primary care needs to be standardized".
- "It is [plant] an important health resource that needs to be studied better".
- "It must be added to the knowledge of modern medicine".
- "Establish the use of the resources provided by the medicinal flora".

Their opinions at the end of the activities were:

- "It is important to acquire this knowledge to have an impact and multiplying effect among health career students".
- "[their use] must be included as a subject in health-related careers".
- "Plants with toxic action should be known".
- "It is necessary for the population to know the dosage for medicinal plants use".
- "It is necessary to promote the rational use of medicinal plants".
- "They [medicinal plants] contribute to the improvement of the population health status".

The opinions voiced by the students in health careers in the same countries, at the beginning of the activities were:

- "[Herbal] . . . It is a healthier therapy".
- "[Herbal] . . . It is a support therapy to conventional treatments".
- "[Plants] . . . should not be the only resource for treating patients".
- "Can only be used as a result of scientific studies".

Some opinions at the end of the activities were:

- "It is an opportunity for Primary Health Care".
- "It is necessary in isolated communities".
- "I hope to get to know more about them for my medical practice".
- "Interesting as an alternative therapy, if it is used carefully".
- "[This] subject must be included in the curriculum of health sciences careers".

Within the **quantitative** aspects of the evaluation, in Honduras, Nicaragua, Panama and the Dominican Republic, diagnostic tests to assess knowledge have been implemented at the beginning and at the end of the course/ workshop aimed at health promoters and health professionals. The same test is used at the beginning and the end of the activity. The parameters to be evaluated differ for each group. A score of less than 60 is established as a failure.

Some questions asked are: what is the importance of the botanical identification of medicinal plants? what is the criteria for the scientific validation in the TRAMIL program? what are two medicinal plants for respiratory, gastrointestinal, and urinary conditions? as well as two toxic plants they know. Those questions that presented the greatest degree of difficulty were related to the importance of botanical identification and the criteria for the scientific validation criteria in the use of part / s of medicinal plant / s.

Out of 150 participants, 10.7% passed the initial diagnostic test as opposed to 71.4% who passed the test at the end of the course/workshop. The exit score indicates a significant level of understanding of the contents presented, especially in the questions related to the use of medicinal plants, as opposed to the conceptual questions, which were related to new terminology for most of the participants. Other factors that might explain the exit score are the limited time allocated to develop these new topics and the conference methodology that should be adjusted to the academic level of the audience.

The evaluation of the workshops/course, using a questionnaire that is applied at the end of the activity, have four aspects: one related to the **self-evaluation** of the participants that includes questions about the degree of knowledge on the subject before the workshop/ course, the degree of applicability of the course/workshop content in their

practice and the degree of satisfaction about their attendance to the workshop/course. Another aspect includes the **evaluation of the overall activity**, fulfillment of objectives, the program, thematic content, and materials used. The **methodology and resources** used are also addressed in the evaluation and finally the **coordination**, **organization**, **and logistics** of the program. The indicators are excellent, very good, fair, poor. After data gathering the evaluation results are obtained.

When asked if they had received previous training in medicinal plants, 67% answered that they had not and the remaining 33% had received some training during one to three days, which confirms the need to strengthen and continue training on this subject. In their self-evaluation, 75% of the participants considered that their knowledge and skills before the training were poor and deficient, 84% stated that the pertinence of the knowledge acquired for their professional practice was excellent and very good and 94% stated as excellent and very good the degree of satisfaction for participating in the course/workshop.

The evaluation processes that have been carried out to date, revealed some limitations to the TRADIF courses/workshops that can be grouped into two general sections:

Organization and monitoring:

- The participation of health professionals, mainly general practitioners, is affected by organizational aspects in their workplace, which in some cases prevents their involvement in dissemination.
- The selection and allocation of health professionals to attend the courses/workshops and health agents assigned to the communities, does not always subscribe to their specific training fields and the "filling the quota" policy affects the development of the courses/workshops.
- The uncertainty in the permanence of health professionals in their workplace does not favor the continuity of the process.

Content and methodology:

- The contents that have presented the greatest degree of difficulty to the participants are botanical aspects and scientific validation, which indicates that their suitability should be reviewed with the members of the network, specialists in these topics.
- The use and application of scientifically validated use / part of medicinal plants by trained personnel has not been supervised, which does not allow to assess the impact of this resource in primary care.

During the evaluations, suggestions, recommendations, or ideas for activities to promote the popular uses of medicinal plants are collected, some of these are described below:

- Set up gardens in schools and offer talks to boys and girls
- Offer talks to fellow employees in workplaces
- Prepare and offer herbal remedies during family activities
- Set up medicinal plant's demonstration gardens in health centers
- Offer talks to patients

 Promote meetings between neighbors to practice the preparation of herbal remedies, according to the Caribbean Medicinal Plants for Primary Care booklet.

Self-assessment for the evolution of TRADIF

In 2012, during the TRAMIL scientific workshop held in Cartagena, Colombia, the TRADIF dissemination strategy was reformulated based on past experiences.

It was aimed at achieving the following goals:

- Increase the use of medicinal plants in the Caribbean Herbal Pharmacopoeia among surveyed families, areas of interest and health centers.
- Increase the knowledge and access to medicinal plants among families, educational institutions, and health professionals.
- Facilitate networks and local self-management groups to allow TRAMIL sustainability.

As a result of this work and the challenges posed, some **lessons learned** can be established:

Reappraisal of the Caribbean traditional knowledge:

- TRADIF has made possible to bring health managers closer to traditional and scientific knowledge and bring science closer to traditional knowledge. It is in this unity of understandings and knowledge that the participants in interactions among Caribbean territories express how they feel and how they live this reappraisal: "We must thank our ancestors for leaving us the legacy of the knowledge of medicinal plants".
- Mrs. Teresa Santos, 50 years of age, a midwife from Boca de Bolsa community, in Chiriquí Province, Panama, said: *"I support all the activities that help us to improve the treatment of the sick people and I thank those who come from afar to help us" or* in the phrase: *"More than a resource, medicinal plant are a cultural asset".*
- To communicate this legacy in the Caribbean is to promote traditional values and culture, is to do science and it must continue as done by Mrs. Flora Bejerano, Ngobe-Bugle healer, from the Empanada de Chorcha community in Chiriquí, Panama, who has transmitted her knowledge to three generations of her family.

Popular knowledge / scientifically validated knowledge:

- TRADIF has managed to fulfill the commitment to return to most of the surveyed communities the results of the research work carried out, but it has yet to demonstrate the impact on the health of the surveyed territories.
- TRADIF has clearly defined the target groups for dissemination, has developed designs and differentiated instruments in accordance with these groups, allowing to strengthen and increase the quality of TRADIF.
- TRADIF should establish a Caribbean archive of outreach activities and update the accounts of primary care with medicinal plants for community health managers.



Photo: Mrs. Flora Bejerano, healer from Ngobe-Bugle From the Empanada de Chorcha Community, Province of de Chiriquí, Panamá, and her family (2005).

Primary Health Care and Health Policies:

TRADIF has made significant progress in Caribbean the approaching and raising awareness about the use of scientifically validated medicinal plants in both Primary Health Care and higher education. It continues to be a network's challenge, to achieve the steadiness of this process among the scientific community, health authorities and higher education.

• Currently, the TRAMIL Caribbean

Herbal Pharmacopoeia is used in the French Antilles, Brazil, Colombia, Cuba, Haiti, and the Dominican Republic, as an important scientific reference for the ministries of health, the training of health professionals and in higher education institutions that offer health careers.

Technical and higher education in health careers and medicinal plants knowledge:

- There is a need for a policy about the topic from the higher education institutions authorities.
- The process of curricular update and transformation in the universities and in health programs limits integration into the curriculum.
- Although medicinal plants are not part of the curriculum in medicine and nursing careers, faculty in these programs include the topic on their own initiative. This contrast with chemistry, pharmacy and biology curriculum that include subjects related to medicinal plants such as pharmacognosy, pharmaceutical botany, and pharmacobotany.
- The lack of trained human resources to prepare faculty on the subject, coupled with an emerging interdisciplinary collaboration within health sciences faculty, requires the involvement of the ministries of health to establish a strategy of curricular integration.
- Lack of support to scientific research couple with the poor availability of financial and material resources to carry out this work.

Access to scientific information:

- There is a Caribbean database with iconography of 365 plant species, 130 monographs of medicinal plants, more than 300 scientifically validated uses, 100 health problems that can be treated with herbal medicine.
- The idea is to save the biodiversity associated with traditional self-care practices validated by scientific methodologies supporting their quality, safety, and efficacy. There are also more than 1,000 images that illustrate these species in open access in three languages, Spanish, English and French.
- Publications and printed support material, some in vernacular languages, to conduct TRADIF in communities, train health professionals and technical and higher education faculty in health careers: the Caribbean Herbal Pharmacopoeia, medicinal plants manuals for Primary Health Care, prints, and educational posters.

Conservation and biodiversity:

- There is an increase in breadth and depth of the discussion about medicinal plants and biodiversity by means of community medicinal gardens, the implementation of emergency plant libraries and medicinal gardens in health centers.
- Planned publication of four volumes of medicinal plants conservation and cultivation manuals in three languages.
- The conservation degree of the TRAMIL species must be updated (the last one was carried out in 1994 by Gary Martin, from People & Plants) and this strategy should be strengthened in the next scientific workshops.

Needs assessment:

- The Intercultural, multidisciplinary, and inter-institutional work constitutes one of the strengths in TRADIF development. It has been adapted to the characteristics and human resources present in the Caribbean territories.
- The multilingual nature of the Caribbean has been a challenge in the dissemination and editing of publications in various languages, including vernacular languages.
- Self-sustainability efforts are a fundamental aspect for future research and dissemination work in the Caribbean Basin.

Chapter 5. Acknowledgments and References

In this chapter the TRAMIL Program wants to acknowledge and thank Maria Medina, MD (TRAMIL-Nicaragua), Wendy Torres, PhD (TRAMIL- Mexico), Rafael Durán, PhD (TRAMIL- Mexico) and Jannette Gavillán-Suárez, PhD (TRAMIL-Puerto Rico) for the research, compilation, analysis, edition, and translation of this report. Also, TRAMIL wants to recognize the invitation of Juliette Smith, PhD, Executive Director of "Lássociation de Recherche en Epidemiologie et en Biodiversite (AREBio) from Martinique for her interest in TRADIF experiences and lessons learned and AREBio support appointing this report.

The report will be available in Spanish, English and French in the TRAMIL Website (www.tramil.net) to inform, inspire and spur TRADIF initiatives.

The TRAMIL dissemination program (TRADIF) has produced a significant amount and diversity of publications and documents that can support future dissemination efforts. Following are references to the documents that are important in the conceptualization of TRADIF activities, as well as the instruments and educational activities that can be used to plan, design, and implement dissemination activities. These documents can be requested from TRAMIL by filling out the forms available in annexes 1 and 2.

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Appendix 1. TRADIF Form to REQUEST Materials

Objetivo de la actividad de difusión/Dissemination activity objectives:

FORMULARIO DE SOLICITUD DE MATERIAL DE DIFUSIÓN TRAMIL

Características generales del grupo a quien va dirigida la actividad (amas de casa, profesionales de la salud, estudiantes, etc) / Goup profile that will attend the activity (housewives, health professionals, students, etc.):
Actividades de difusión a realizar (talleres, jardines, cursos, reuniones, etc) /Dissemination activities that will be offered (workshops, gardens, courses, meetings, etc.):
Especificar el lugar de difusión (rural, urbano, hospital, escuela, campo, jardín etc)/ Specify, dissemination site (rural, urban, hospital, school, countryside, garden etc.):
Tipo de material solicitado/ Resources requested:
Cantidad de material solicitado/ Amount of resources requested:
Fecha de entrega del reporte final (como se describe a continuación) / Date of submission of dissemination activity report (as described below):

Firma/ Signature: ______ Fecha/ Date: _____

*Los materiales se entregarán con una compañía de transporte internacional. POR FAVOR, provea la dirección detallada y exacta para garantizar la entrega. / The dissemination materials are going to be delivered by an international courier. PLEASE, make sure that you provide the detailed and accurate address to assure delivery.

Appendix 2. TRADIF Form to Report TRADIF Activities

FORMULARIO PARA EL INFORME FINAL DE ACTIVIDADES DE DIFUSIÓN TRAMIL

1. Objetivo(s) cumplido(s)/ Objective(s) accomplished:

Grupo de personas que asistieron a la actividad, número de personas, sexo, edad, nivel social, grado profesional/Attendees profile, number of attendees, gender, age, socioeconomic status, profesional status:

- 2. Limitaciones durante el desarrollo de la actividad relacionados con los materiales/ Limitations during the dissemination activity related to the resources requested:
 - a) ¿Las especies presentadas fueron suficientes? / The number of plant species discussed were adequate?
 - b) ¿Los usos presentados cumplieron con las afecciones más frecuentes de la población? / The uses discussed represented the most common ailments of the group of attendees?
 - c) ¿Las fotos de las especies presentadas en los materiales fueron suficiente para su identificación?/ The photos/pictures presented were adequate for identification?
 - d) ¿Se reportaron nuevos nombres comunes para las plantas? / New common names were reported for the plant species?
 - e) ¿El material facilitó el trabajo con la comunidad o presentó dificultades? / The resources enabled the activity or presented any drawbacks? Please, specify.
 - f) ¿Tienes algunas sugerencias para la mejora del material? / Do you have any suggestions to improve the resources used?
- 3. Envío de evidencias de las actividades a través de fotos o videos. Please, submit evidence of the dissemination activities as photos or videos.

¿Autoriza el uso de las evidencias para su difusión en sitios de internet? / Do you authorized dissemination in internet of the evidence submitted?

Nombre/ Name: _____ Fecha/Date: _____