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A Study of All India Pingalwara Charitable Society Amritsar: An NGO Promoting Organic Farming in Punjab

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Abstract

In recent years, the role of non-governmental organizations has increased in most developing countries. This article studies the case of Punjab where the number of prominent NGOs has emerged. The general advantages that NGOs have over other developmental agencies working on environmental issues are their flexibility, speed of operation, and ability to respond quickly to changing circumstances. These organizations concerned with environment and development issues and problems, can play an important role in working towards sustainable development. They are innumerable all over the world and their services are voluminous and invaluable. As worldwide organizations, NGOs can provide services from the North Pole to the South Pole. In the present study, the NGO engaged in various activities related to environment protection like awareness rising among people through publishing and distribution books, promoting organic farming, conducting seminars and workshops. Such human endeavour towards individuals and collective human happiness is worth mentioning.

Keywords: Punjab, Non-governmental Organizations, Environment, Pollution, Organic farming, Awareness

Introduction

A Non-Governmental Organization by definition is not one of the organization or departments of the government. NGOs are secular in every sense. Their aim is the welfare of the people. Even when they implement the relief or rehabilitation or social welfare programmes of the government, they cease to be government organizations. They fight for the rights of the people. Voluntary organizations by dimension surpass any unique definition because of their character, composition, function, form, scope, and service, geographical area of operation, territorial occupation and target groups. It is noted that: "A non-profit making, voluntary, service-oriented/development-oriented organization, either for the benefit of members (a grass-root organization) or of other members of the population (an agency)". In terms of their organizational and operational framework NGOs are classified as: Community Based Organization (CBO), Donor Organized Non-Governmental Organization (DONGO), Government Organization Non-Government Organization (NGO), Non-Government Development Organization (NGO), Non-Government Development Organization (NGO), Private Development



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Organization (PDO), Public Service Organization (PSO), Private voluntary Organizations (PVO), Quasi Non-Governmental Organization (QANGO), Voluntary Agency Organization (VAO) and Voluntary Organizations(VO).

All voluntary organizations are called NGOs irrespective of their size, scope, function and geographical location. Generally NGOs focus on social service or community building task and relief works or disaster management or education. Awareness programmes and action plans are their job of prime concern.

Environment pollution simply means the contamination or undesirable changes of physical, chemical and biological quality of environment. Classification of environmental pollution is difficult task because the pollutants and the media through which the pollutants are transported are all inter-connected and interrelated. In the current scenario, Punjab is dealing with different kinds of pollution, such as air pollution, soil pollution and water pollution. Pratiksha and Sharma (2020) conducted a study on the status of environmental pollution in rural Punjab and its management. Their study indicated that air pollution was observed higher than soil and water pollutions in rural areas of Punjab. It is estimated that in Punjab more than 17 million tons of rice stubble is burnt every year. The burning of paddy straw causes nutrient losses like 3.85 million tones of organic carbon, 59,000 tones of nitrogen, 20,000 tons of phosphorus and 34,000 tons of potassium. About 75.0 per cent of its population depends directly on agriculture. Punjab is one of the most fertile regions in India. Indian Punjab is called the "Granary of India" or India's bread-basket". It produces 10.26 per cent of India's cotton, 19.5 per cent of India's wheat, and 11.0 per cent of India's rice. In worldwide terms, Indian Punjab produces 2.0 per cent of the world's cotton, 2.0 per cent of its wheat and 1.0 per cent of its rice. Punjab consumes highest amount of fertilizers in the country, amounting to almost 10.0 per cent of the national consumption with just 1.5 per cent of geographical area of the country. The worst problem with the pesticides is that it has contaminated drinking water very severely. It may not be wrong to say that Punjab is becoming hotspot for cancer in India. The excessive use of fertilizers and pesticides has hugely contributed towards degradation of the quality of soil also.

Air pollution is the greatest threat to human health in India and the average Indian resident is set to lose five years of life expectancy if the WHO guidelines are not followed, according to this new report by the Energy Policy Institute at the University of Chicago (EPIC).

Data analyzed by the Indian Meteorological Department Indicates that the temperatures over Punjab have been rising over the years as it is elsewhere in India and the world, and in 2010 the maximum and minimum temperatures in the Punjab region have increased by 0.5-1.0° C with the respect to the base line 1971-2000. There have been spatial variations in precipitations across the years with some years experiencing more than normal rain fall and some years experiencing deficit rainfall.

Recently a Punjab Pollution Control (PPCB) sponsored epidemiological study done by Post Graduate Institute of Medical Research (PGIMR) Chandigarh has indicated that rise in cancer cases in cotton belt in Punjab. The study indicates that cotton belt of Punjab is engulfed by lethal pesticides and causing major health problems. Though this study was done in one Talwandi Sabo block of Bathinda district but the similar symptoms are emerging from entire cotton belt. The situation is so grim that village after village reporting cancer, reproductive disorder, birth of mentally retarded children and other pesticide related diseases. The PGI study clearly indicts pesticides for high prevalence of cancer in the area. Study found both tap and ground water laced with carcinogenic chemicals. Tap water contains high content of arsenic and chromium. Where as ground water also was replete with arsenic, chromium, nickel and iron.



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Even these deadly pesticides had seeped into locally- grown vegetables as well. The cauliflower was toxicated with Heptachlor Endoepoxide, Chlorpyrifos, Alpha Endosulfan and Alfa HCH. It is also most worrisome factor that traces of Persistent Organic Pollutants- POPs are found at large in Punjab. This is slow poisoning of Punjab. POPs are banned in majority of countries. POPs are known as Endocrine disrupts and the main reason behind neurotoxicity, immunotoxicity, reproductive disorders, testicular cancer, and congenital malformations. Even the motherhood is challenged by POP's through foetotoxicity. The pollution from POPs knows no boundaries. They travel long distances and get deposited and accumulated in terrestrial and aquatic ecosystems. They are highly toxic even in very low concentrations, and resist degradation. The POPs can accumulate in fatty tissue (Bioaccumulation), becoming more concentrated higher in the food chain and with time by biomagnification process. Kheti Virasat Mission (KVM) volunteers also came across the frightening truth in Rampura block of Bathinda district in year 2002. Several villages facing acute health problems in this block. The high cases of cancer, reproductive health disorder, congenital abnormalities and physical- mental illness is a common factor here. More over the contaminated ground water is also aggravating the devastating situation. M.V. Nadkarni (2009) in his research paper entitled "Poverty Environment, Development: A Many Pattered Nexus" elaborately discusses the following: the thesis that poverty leads to environmental degradation. The poor are dependent on nature for livelihood; they are very vulnerable to natural calamities, environmental degradation and ecological disaster, of-course, man-made like Bhopal poisonous gas tragedy. The author discusses poverty alleviation versus environmental degradation. Reem Samual and V. Thanikachalam (2003) elaborated the following in their collaborative project, "Non Governmental Organisations (NGOs) Spearheading Public Participation Environmental Issues": (a) A higher standard of living and development are two sides of the same coin. However, it shouldn't be at the cost of the environment. Development that lacks control or concern is incorrect. (b) A review of literature reveals that non-governmental organizations have played an essential role in organizing the people. NGOs operate at local, regional, national, and international levels. According to research from the internet, environmental publications, books, journals, and newspapers, environmental NGOs can have a good impact on protecting and supporting human growth. (d) Despite their flaws, environmental NGOs have been able to protect the environment, and their presence is crucial for streamlining "development projects" because they concentrate their development efforts on sustainable development. NGOs have long history of service and dedication and work with specific objectives and mission. They mobilize and motivate people to participate in their welfare programmes. The government of India support NGOs in implementing development projects in the areas of agriculture, forestry and poverty alleviation. Biodiversity conservation programmes are organized in collaboration with the Department of Forestry and Environment.

The Scope of the study

This study focuses on the role of NGOs in protecting the environment in Punjab. As the NGOs play complementary roles with the government of Punjab and with the government of India, they work with the Punjab State Pollution Control Board as directed by the Central Pollution Control Board of India in protecting the environment. That is to say that the NGOs are playing partnership role in preventing environmental degradation and promoting ecological conservation projects. NGOs thrive with the funds they receive from the government, the private and from the foreign agencies or donors. Hence it is imperative to study their objectives, activities and achievements. The growing population and emerging



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industrial development have posed environmental deterioration in and around Punjab. The efforts and the programmes of Government are insufficient to meet the environmental challenges. The NGOs are vibrant sector whose activities can be considered as supportive activities in the area of environmental protection. In this context, it is imperative to study the role of NGOs towards environmental protection by performing various environmental supportive activities.

Methodology

There are 2184 NGOs in Punjab. Among them 240 registered NGOs are concentrating on environmental issues. The present study discusses the role of NGO All India Pingalwara Charitable Society Amritsar in environment protection in Punjab. The study is exploratory and descriptive in nature. Proper care was taken to collect information with the application of both primary and secondary sources. Accordingly, an interview schedule was prepared and questions were framed both open and close ended for the purpose of data collection through primary source. Secondary data is taken from Reports of NGO, various books, journals and magazines. 50 respondents have been taken as a sample size. Snow ball sampling method was used for collection of data. Well-structured and pre-tested questionnaires were given to Secretaries of this NGO. The questionnaire consists of 3 sections dealing with general profile, sources of funds and environmental programme. Information from the beneficiaries is collected through personal interviews using interview schedule.

Organic Farming in All India Pingalwara Charitable Society Amritsar

Pingalwara Charitable Society is a shining example of how to give possibilities to those who are less fortunate since it runs an effective rehabilitation project for the poor, homeless, mentally and physically handicapped. Bhagat Puran Singh established Pingalwara in 1924. It helps the homeless and the poor with life-changing results.

The organization provides educational, vocational, and counseling services to the region's homeless, emphasizing not just on material resources, but also skill and personality development. The main branch in Manawala has a children's ward, rehabilitation centre, printing press, dispensary, medical lab, dental care, and communal kitchen for inmates. Pingalwara also runs a blood bank, a shelter for mentally impaired children, and a free elementary school in a slum neighbourhood of Amritsar. Working tirelessly for the benefit of the impoverished, Dr. Inderjit Kaur director of pingalwara, feels that rehabilitation of the homeless is a gradual process that demnds sincerity. Pingalwara assists them in reentering society after they have finished their schooling by providing them with medical care, food, lodging, and funding for their education. Teaching inmates woodworking, hand weaving, gardening, maintaining organic farms, and housekeeping are all part of the skill development plan. Several inmates have undergone rehabilitation and are now working as volunteers for society and inspiring others to follow their example.

Chemical free farming in Pingalwara's Organic Farm

Pingalwara organic farm motivates many to go natural. Going natural appears to have become the key mantra of boosting immunity and staying healthy especially during corona virus pandemic and that's the reason a large number of people are trying their hands on cultivating vegetables at home without using harmful chemicals laden pesticides and fertilizers.



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The overuse of chemical pesticides and fertilizers has negative consequences on reproductive health, including cancer and female foetal loss. Pingalwara fervently opposes the widespread use of chemical fertilizers and pesticides in agriculture and preaches against it. Humans who are exposed to pesticides for an extended period of time may develop serious immunological, neurological, and reproductive diseases, as well as cancer in some situations. For a pregnant woman, exposure to particular pesticides can be "hell" because it can quickly result in the death of unborn child and, even if the child survives, will have several problems or even loss of limbs.

Run by All India Pingalwara Charitable Society, the Bhagat Puran Singh Natural Agriculture Farm not only fulfils the demand of a part of the food served to the inmates of pingalwara but has also emerged as a beacon of hope for one spot guidance for the organic vegetable growing enthusiasts. The founder of the farm, said that many people visit the farm to learn growing vegetable organically adding that vegetables grow at the farm might not be one hundred percent pesticides free but certainly their (pesticides) content was far lower than those available in friendly neighborhood 'sabjiwala bhaiya'. Before sowing the seeds they treat them with 'beejmrit'which was a preparation of microorganisms found in cow dung which in turn protect the crop from harmful pathogens. Similarly, the 'jeevamrit' was prepared using jiggery, cow urine, flour, cow dung etc. which was sprayed on the plants for better growth. To protect the crops from the pest attack, he informed that they prepare 'agniastra' which was a mixture of green chilies, urine, garlic, neem etc.

The awareness among consumers about nutrition and health increases especially during coronavirus pandemic, a large number of people are approaching for guidance on organic cultivation of vegetables which in turn helps to boost immunity. Food cooked from chemical-free pesticides and fertilizers provide better quality nutrients which in turn help to boost immunity and automatically become super food. The study found that nearly 55 acres of farm fulfill six months demand of vegetables required for nearly 2500 to 2700 inmates of Pingalwara besides they meet whole years demand of 'gur' and rice and four months demand of wheat. The farm also grows their own turmeric and fodder for animals. Many people come to them after Google search on the benefits of organically grown vegetables but when they themselves see them cultivating the vegetables using zero chemicals they go back highly impressed and tries to adopt a poison-free lifestyle experimenting with growing vegetables on their own. It is observed that in the recent past couples of months many people have adopted a newfound habit of growing their own vegetables either on rooftops or varandha's without using chemicals owing to health concerns.

Workshops and Seminars organized for farmers to promote natural farming in Punjab

As part of a series of natural farming and rural economy workshops sponsored jointly by the Unnat Bharat Abhiyan and the Pingalwara Society, a two-day north zone workshop was inaugurated at Pingalwara in Manawala. The purpose of the seminar was to encourage organic and natural farming, so that people could be saved from the ill effects of pesticides and chemicals fertilizers. The inaugural address in the seminar emphasized on the development of natural farming and encouragement of cows in the rural economy. Dr. Inderjit Kaur, president, All-India Pingalwara Charitable Society, said the founder of Pingalwara Bhagat Puran Singh, had stressed on the development of rural economy and on saving the livestock. Due to intensive utilization of fertilizers and pesticides, people were suffering from various diseases. The workshop was attended by agricultural scientists and progressive farmers from the region.



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Many farmers get lessons in natural farming and are advised to restrict use of pesticides. Eco-Amritsar arranges for a master class to promote natural farming in Punjab. Over 40 participants from Amritsar, Ajnala, Mehta, Jandiala and Nawanshahar, were brought to Bhagat Puran Singh Pingalwara farm for an experimental programe on organic cultivation. This follows the workshop held at Lalchian where 160 farmers had gathered for training. The feedback from this workshop was encouraging but the need to exhibit a model nature farm as a part of such training was felt. The founder of the farm conducted this hands-on activity where combining of various crops, use of farm yard manure, making of fertilizers and natural pest control were introduced to the community. The ill of toxic food consumption was also elucidated. At the end of the session, five farmers from these regions pledged to go natural immediately and would be imparted continued assistance in their ventures. The Eco-Amritsar funded bus was utilized to bring interested farmers fortnightly so as to showcase the goodness of non-toxic cultivation in order to break the stranglehold of the paddy-wheat rotation. An effort was made to teach the communities how eco-friendly techniques can give substantial yields of health-giving crops.

Pingalwara's organic farms at Dhirakot were the first to introduce the concept of clean, natural farming to the locals in the region. They were the first ones to produce broccoli using natural farming. They managed to achieve ground-breaking yield of sugarcane, spending not more than Rs 30,000 per acre as input cost and an impressive 400 quintals per acre yield in the first year itself. Now, initiating the programme to educate the local farmers about these natural farming techniques and the variety of crops produced through them, the founder of the farm, the man behind the organic farms at Pingalwara and Khalsa College, is conducting a series of workshops. The success of these techniques is for everyone to see and the workshops are another way to give outright information and cut down on the myths surrounding natural farming. They covered a few villages in and around the city's periphery and even talked to students of BSc Agriculture sciences.

The expert horticulturist produced high yield of sugarcane at the Khalsa College's organic farms and has also been improvising the techniques by introducing new crop varieties. They have sown variety of soybean, popular tress and wheat variant for those who have wheat allergy. Also, using natural fodder and fertilizer by composting farm waste or combination of cattle dung/urine, pulses, garlic and green chili, they have been creating manure for their crop. These informational tips are simple yet unknown to most farmers. It is important to educate them on clean methods of farming. In countries such as Argentina and Israel, such techniques are being adopted.

The study found that in order to get the intended outcomes, they diligently adhered to the rules established by the Punjab Agricultural University, Ludhiana. He thanked Amravati-based agricultural expert Subhash Palekar for his assistance in establishing the farm in 2005.

According to the society's president, Dr. Inderjit kaur, the goal of constructing this model farm was to serve as an organic farm role model for the farmers in the state. She claimed that they had written environmental material and distributed it for free at the Golden Temple and other religious sites. She continued," We have planted at least 10 lakh seedings.

The role and scope of an NGO, like the spectrum of a rainbow, are diverse in socio economic development activities; ecological and environmental related activities. In terms of the environment, it is a subject that embraces all of humanity as well as living and non-living things in the universe. It is a global issue since the environment influences all living and non-living things, both human and non human. As worldwide organizations, NGOs can provide services from the North Pole to the South Pole.



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The elements of nature that assist food production have been abused. At this juncture, when rice and wheat production is ample in rain-fed regions of the country, Punjab must revert to growing cash crops, vegetables and millets, which are great sources of nutrition with minimal risk," said by the chairman, EcoAmritsar.

Conclusion

There are some limitations of the study. The study confines itself to the NGOs in Punjab. It cannot be generalized to all the NGOs in all the places. Some of the NGOs are reluctant to furnish their information to the researcher. Most of the NGOs concentrate on education and other social works. Some of the NGOs refuse to disclose the details of donors and their donations. Most of the NGOs lack formal structure and systematic functioning like planning, implementation, reporting and reviewing due to paucity of funds. The methodology of this NGO covers how to germinate seeds, provide organic inputs, use natural pest control methods, and combine crops for the best results. Pathological and entomological issues pertaining to paddy crops were discussed by farmers. In the form of evidences and recommendations, experts offered the groups with clear methods. It is believed that these contacts will develop a community of cultivators of non-toxic food, which will improve the area's health and economy. The Punjab paddy and wheat syndrome is spreading as the cotton belt adopting the same. In a state that is already struggling with groundwater depletion, the trend is concerning. The other factor is the growth of fatal diseases among the state's population, both as consumers and members of the farming community, which are directly linked to toxins. Poor and socially disadvantaged people, whom NGOs support through their programmes, are usually the most vulnerable to such problems. This research paper concludes with two major recommendations: (1) NGO staff must be given time and opportunity to learn, (2) NGOs must share information, promote ideas and influence policy and practice. Regarding NGOs strengths and weaknesses, various opinions exist. Both the usefulness of NGOs and their weaknesses are overstated. The employees of NGOs endure challenges and are required to forgo their personal luxuries in order to advance the welfare of the people. NGOs fight against a variety of problems, including famine, environmental pollution, climate change, global warming, ozone depletion, solid waste management, water scarcity, energy crisis, socio-economic injustice, slavery and oppression. Faithfulness and mutual trust are NGOs' real assets, but they keep the people at bay due to their authoritarian approach. The ability, simplicity, popularity, strategy, approach, familiarity, being one with the people, acceptance of the people, and the faith that people have in them allow NGOs to reach out to people.

References

- 1. Pratiksha and Sharma. (2020). Status of Environment Pollution in Punjab and its management. International Archive of Applied Sciences and Technology. Vol. 11 [4], 65-71. https://soeagra.com/iaast/iaastdec2020/19.pdf
- 2. Niti, Gupta (2019, March). Paddy Residue Burning in Punjab: Understanding Farmers' Perspectives and Rural Air Pollution. https://www.ceew.in/sites/default/files/CEEW-Paddy-Residue-Burning-in-Punjab-Farmers-Perspectives-Issue-Brief-29Mar19.pdf.
- 3. L.S. Kurinji and Srish Prakash (2021, October). Why Paddy Stubble Continuous to be Burnt in Punjab? Meeting Challenges with Solutions.



E-ISSN: 2582-2160 • Website: www.ijfmr.com • Email: editor@ijfmr.com

http://www.indiaenvironmentportal.org.in/files/file/paddy%20stubble%20burning%20in%20punjab.pdf.

- 4. The Tribune. (2019, May). Punjab's Water Crisis. https://www.tribuneindia.com/news/archive/editorials/punjab-s-water-crisis-772934.
- 5. United Nations Educational, Scientific and Cultural Organization. (2021). World Heritage forests: Carbon sinks under pressure. http://www.indiaenvironmentportal.org.in/files/file/world%20heritage%20forests.pdf.
- 6. Yap, Nonita. (1990). NGOs and Sustainable Development. The Greening of World Politics. 45, N0.1, 75-105. https://www.jstor.org/stable/40202652
- 7. Guibaud, Genevieve Massard and Rodger, Richard. (2011). When Environmental and Social Dimensions Meet. Environmental and Social Justice in the City. White Horse Press.
- 8. Chandra, Snehlata. (2001). Non-Governmental Organisations Structure, Relevance and Function. Kanishka Publishers.
- 9. Basu, Rumki. (1997). NGOs and Environmental Protection in India. Kanishka Publishers.
- 10. Paul, Bimal Kanti. (2003). Relief Assistance to 1998 Flood Victims: A Comparison of the Performance of the Government and NGOs. The Geographical Journal, 169, No. 1, 75-89. https://www.jstor.org/stable/3451541.
- 11. Post Graduate Institute of Medical Research, Chandigarh. (2005). Environment Health Crisis in Cotton Belt of Punjab. https://www.mpcb.gov.in/healthenvt/punjabhealth.
- 12. Henry De Almeida, K. (2010). An Economic Analysis of the role of Non-Governmental Organisations of Madurai district in Environmental Protection. https://shodhganga.inflibnet.ac.in/bitstream/10603/125088/8/08_chapter%202.pdf.
- 13. Greenstone, Michael, Hasenkopf, Christa and Lee, Ken. (2022, June). Air Quality Life Index: Annual Update 2022. http://www.indiaenvironmentportal.org.in/content/472977/air-quality-life-index-annual-update-2022/.
- 14. EIACP Centre: Punjab Status of Environment & Related Issues. (2021, June). Observed and Projected Climate: Punjab. http://punenvis.nic.in/index2.aspx?slid=5925&mid=1&langid=1&sublinkid=1114.
- 15. The Tribune. (2016, March). Adopt Organic Farming: Experts. https://www.tribuneindia.com/news/archive/amritsar/adopt-organic-farming-experts-209502
- 16. The Tribune. (2016, August). Farmers get lessons in Natural Farming advised to restrict use of pesticides. https://www.tribuneindia.com/news/archive/amritsar/farmers-get-lessons-in-natural-farming-advised-to-restrict-use-of-pesticides-284729.
- 17. International Peasants' Movement. (2006, November). Environmental Health Crisis in Punjab, Who cares? https://viacampesina.org/en/environmental-health-crisis-in-punjab-who-cares7/.
- 18. Awasthi A, Singh N, Mittal S, Gupta P and Agrawal R. (2010). Effects of agriculture crop residue burning on children and young on PFTs in North West India. Science of the Total Environment. 408, Issue 20, 4440-4445. https://pubmed.ncbi.nlm.nih.gov/20637491/.
- 19. Agarwal R, Awasthi A, Singh N, Gupta, P. K., Mittal, S.K. (2012). Effects of residue burning smoke on pulmonary functions and Oxygen Saturation level of human beings in Patiala (India). 429, 161-166. https://www.sciencedirect.com/science/article/abs/pii/S0048969712004780?via%3Dihub.



E-ISSN: 2582-2160 • Website: www.ijfmr.com • Email: editor@ijfmr.com

- 20. Costa, Anna De. (2012, March). Can Organic Farming enhance livelihood for India's poor? https://www.theguardian.com/global-development/poverty matters/2012/mar/15/organic-farming-india-rural-poor.
- 21. Driscoll, Mark. (2012, October). How can we built sustainable farming system for all?. https://www.theguardian.com/sustainable-business/blog/farming-system-principles-based-sustainable.
- 22. Chenniappan, P., Ramalingam, K., Pazhanivelan, S., Kaliaperumal, R. Smart Farming: Internet of Things (IOT)-Based Sustainable Agriculture. Agriculture. 12(10), 1745. file:///C:/Users/welcome/Downloads/agriculture-12-01745-v2.pdf.
- 23. Bloom, Adam and Writer, Senior. (2022, October). Against the Grain: Farming for the Planet in India's Breadbasket. https://www.nature.org/en-us/what-we-do/our-priorities/tackle-climate-change/climate-change-stories/india-farming-climate-solution/.
- 24. Kaur, Ravleen. (2023, March). Organic agriculture for generating indigenous, clean fuel. https://india.mongabay.com/2023/03/organic-agriculture-is-critical-for-bio-cng-growth/.
- 25. Bera, Sayantan. (2023.January). Meet the farmer with whom India's farming enters carbon credit market. https://www.livemint.com/industry/agriculture/the-promise-of-india-s-carbon-farming-market-11672675836837.html.
- 26. Kanika, M. (2022, February). Top 10 NGOs Helping Indian Farmers in Growing & Sustaining Crops. https://krishijagran.com/blog/top-10-ngos-helping-indian-farmers-in-growing-sustaining-crops/.