Int.J.Curr.Microbiol.App.Sci (2025) *14*(03): 37-42

International Journal of Current Microbiology and Applied Sciences
***ISSN: 2319-7706* Volume 14 Number 3 (2025)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2025.1403.007

Natural Farming is A Boon Against Sustainable Agriculture in Cold Arid Desert in Changthang

Jigmet Yangchan[1*] and Tsering Dolma[2]

[1]School of Agriculture Science and Technology University of Ladakh
[2]Project Assistant DST-Purse University of Ladakh

**Corresponding author*

Keywords

Natural farming, Soil fertility, Socio-economic Status, water holding, infiltration rate

Article Info

Received:
08 January 2025
Accepted:
24 February 2025
Available Online:
10 March 2025

A B S T R A C T

Ladakh, a unique high altitude Cold Arid Trans- Himalayan region which is more sensitive towards persistent climate change. The main source of livelihood in Ladakh region is agriculture. According to latest census report of Ladakh in 2018-2019, the Ladakh region has a reporting area of 60,000 sq.km of which approx..20,000 hectares are been under cultivation. Despite of this the region is characterized by fluctuation in weather, sparse plant density, low organic matter, precipitation scarcity, short cropping season, high wind speed. Farmers having small land holding with low fertility and less income. Chemical farming is not good for the soil health and the soil is becoming unfertile day by day. Chemical farming also harms to the environment**.** People's health is also deteriorating due to chemical farming product. Such farming is also causing economic loss to the farmers so the natural farming is only way to recover from this type of severe problems. Under such condition Natural farming techniques through four pillars of zero budget for the marginal farmers are appropriate solution to uplift their socio-economic status as well as soil fertility of Ladakh. In these studies, we describe methodology of four pillars of zero budgets natural farming at 14000ft, its increase soil properties by increase water holding capacity (2.76%), infiltration rate improved by (0.47%) and (1.82%) porosity increase after using NF technology. Seeing the potential of this NF technology is needs to be disseminated among farmers and its advantage needs to be popularized in entire Ladakh region**.**

Introduction

Ladakh, a unique high altitude cold arid Trans-Himalayan region which is more sensitive towards persistent climate change. The main source of livelihood in Ladakh region is agriculture. According to latest census report of Ladakh in 2018-2019, the Ladakh region has a reporting area of 60,000 sq.km of which approx.. 20,000 hectares are been under cultivation. Despite of this the region is characterized by fluctuation in weather, sparse plant density, low organic matter, precipitation scarcity, short cropping season, high wind speed. Farmers having small land holding with low fertility and less income. This is a big problem for Indian farmers and a serious issue farmers having debt and many farmers are committing suicide. People's health is also deteriorating

due to chemical farming. In view of the harmful effects of chemical farming, the newly introduced agricultural technology among the farmers is Natural Farming, also called Zero Budget Natural Farming (ZBNF). It had its first success in India, especially in Karnataka where it was first developed (Kumar, 2012) and is now spreading rapidly across in India. Natural farming is a new approach of farming where the cost from growing the plants to harvesting is minimum.

Natural farming promises to reduce farmers' dependence on farm credit and production costs and ending the debt cycle for frustrated farmers. Thus, in natural farming farmers cultivate using the residue of their own farm and animal husbandry.

So that farmers do not have to take expensive seeds, pesticides from market. Under such condition Natural farming techniques through four pillars of zero budget for the marginal farmers are appropriate solution to uplift their socio-economic status as well as soil fertility of Ladakh and its boon towards sustainable agriculture

Materials and Methods

What is natural farming?

The concept of natural farming was put forward by Mr. Subhas Palekar. Mr. Subhas Palekar is a native of Amravati, a small village in the state of Maharashtra. Palekar is also entitled as "Krishi Ka Rishi" by many farmers of Mysore. Primary success in Andhra Pradesh is encouraging.

Who conducted experiments on his farm and stated that the constant use of chemicals affects the fertility of the soil and makes the farm unfertile. In 1966-88, Palekar conducted many experiments on his farm and after a lot of hard work, he introduced natural farming to the farmers in which he showed that barren land could be recovered by using the dung and urine of Deshi (Indian) cows. So, he prepared a solution using cow dung, urine, pulse flour, jaggery and fertile soil which was given the name Jeevamruta by him.

The cow having less milk production, the more beneficial its dung is towards soil regeneration (Babu, 2008). One acre of land requires 10 kg of dung per month. The average cow gives 11 kg of dung per day, so dung from one cow can be enough to fertilized in 30 acres of land per month (Palekar, 2014).

Thus, the cost of farming is reduced. Saurabh Tripathi *et al.,* (2018) revealed that natural farming is resource efficient as it minimizes the use of financial and natural resources while increasing crop yield. By restoring the quality of soil and water-related ecosystems, it decouples agricultural productivity and growth from ecosystem degradation and biodiversity loss. The big problem for Indian farmers is that they are constantly mired in debt due to high production costs. In such times natural farming will help farmers to overcome their dependence on loans and sharply reduce production costs so that a ray of hope appears in the mental stress of farmers (Murall, 2016).

The present study was first time initiated at + 14000 ft KVK Nyoma SKUAST-K Leh and also at farmers field of Changthang in 2021-23. Beside that around 409 farmers of Changthang got awareness about this methodology. The purpose of this study was to popularized this ZBNF Natural farming technology in entire Ladakh region which not only reduce input cost of farmers sometime enhance the soil fertility and its boon against Climate Change. As Changthang is known for nomadic farmers and having plenty of raw material especially goat manure. In this we are giving emphasis on goat and sheep manure for making natural farming as Jeevamrut and Ghanjivamrit at +14000ft.

Procedure

There are Four Pillars of ZBNF technology. Two pillars of Mr. Subhas Palekar technology were successfully implemented at ground level at farmer's field at +14000ft in which we use two methods with goat and sheep are mention below.

Step 1

Jeevamrut: Quantity for 200litres for 1 acre of land, for 2 kanal only 50 litres are sufficient. Take 200 litres of plastic barrel, add 10 Kg Goat and sheep dung and mixed urine called rikpa, add 2 Kg of Jaggery, 2 kg of pulses flour/ besan, 2 kg of handful of fertile soil of Tsas/garden in 200 litres of plastic barrel and add water of 200 litres and use wooden stick to rotate the mixture in clock wise direction in every alternate day for rapid fermentation of mixture. Its takes 7-10 days for plan areas but places like Ladakh it took almost 30 days in Changthang, where temperature goes -35^{0}C to 30^{0}C and around 20-25 days in Leh. Use this mixture in ratio of 1:1 for better yield during irrigation time.

Step 2

GhanJeeVamrut: Take above Jeevamrut mixture and spread on powered (Cha phit) / rikpa for preparing large mass of manure for spring season. Let the Jeevamrut mixture to absorb inside the Cha/rikpa and keep it up to 20% moisture contain and made powered form and stored in cold dark place. This method is more benefit when we used at interval of 7-10 days and store it for 6-8 month.

Step 3

Before implementation of jeevamrut, soil nutrient content analysis of barren soil of KVK Nyoma had been done. In which soil nutrient content and its soil texture had been studied. It was observed that soil having three types of soil texture i.e loamy soil, sandy loam and sand texture with very low organic carbon as well as organic matter with no earthworm's population in soil mention in Table 1

Step 4

Applying 1: 1 ratio Jeevamritin every irrigation in entire season we studied. As the soil is new, we put the treatment of local compost and zero budget Natural farming of Jeevamrit for two year and studied about the population of earthworms in soil we studied.

Within two years, we observed that percentage of water holding capacity increase from 48.76 in ZBNF and 46% in local compost. Similarly, the percentage of porosity also increase from 50.82 to 49%. Similarly, population of earthworms also increase from 162 to 69 in local compost as control shown in Table 2

Results and Discussion

Ladakh, Agriculture is the main source of livelihood in this region. Despite of this the region is characterized by fluctuation in climate, sparse plant density, low organic matter rainfall scarcity, short cropping season, high wind speed. Farmers having small land holding with low fertility and less income. Under such condition Natural farming techniques of zero budget for this marginal farmer are appropriate solution to uplift their socio-economic status as well as soil fertility of Ladakh and its boon towards sustainable agriculture. Seeing the technology more reliable and low cost, KVK Nyoma disseminated this technology among 409 farmers including trainings and input in 10 villages adopted in entire Changthang to boost farmers, youth, SHG's and also demonstration unit establish at farmers field Kesar village to enhance socio economic status of remote area as well as to motivate natural farming in Changthang region.

Natural farming techniques of zero budget for these marginal farmers are appropriate solution to uplift their socio-economic status as well as soil fertility of Ladakh and its boon towards sustainable agriculture like Changthang region. As it increases soil properties by increase water holding capacity (2.76%), infiltration rate improved by (0.47%) and (1.82%) porosity increase after using NF technology and population of earth worms also increase double as compare to control or other traditional method and it's also enhanced water saving efficiency which directly help against sustainable agriculture. Seeing the potential as well as low-cost input for poor and marginal farmers this Natural Farming technology needs to be disseminated among marginal and poor farmers and its advantage needs to be popularized in entire Ladakh region.

Table.1 Analysis of Soil Nutrient Content in Study Area

Analysis of Soil Nutrient Content in Study Area				
Types of soil	O.C. (%)	Range(%)	O.M(%)	Range(%)
Loamy Soil	0.19-1.005	0.7-4	0.33-1.73	2-3
Sandy loam	0.22-0.23	0.7-4	0.38-0.4	2-3
Sand	0.11-0.12	0.7-4	0.12	1

Table.2

Treatment detail	Bulk density (Mg m^3)	Particle density (Mgm^3)	Hydraulic conductivity ($cmhr^{-1}$)	Infiltration rate ($cmhr^{-1}$)	Porosity (%)	Water holding capacity (%)
Control	1.33	2.65	0.49	1.70	49.00	46.00
ZBNF	1.23	2.46	1.67	2.17	50.82	48.76
Treatment	Earthworms population (No/m2) in two years					
Control	69					
ZBNF	162					

Figure.1

Figure.2

Figure.3

Acknowledgement

We are thankful to the Programme Coordinator KVK Nyoma SKUAST-K Leh and team for providing necessary facilities. Through this Kendra today we are able to disseminate this technology into ground level in those remotest places of Ladakh and last but not the least most important my entire farmers of Ladakh and other department such as Agriculture, Horticulture, Animal Husbandry, Sheep Husbandry etc. to keep faith on our team to make this research demonstration successfully in entire Ladakh Region

Author Contributions

Jigmet Yangchan: Investigation, formal analysis, writing—original draft. Tsering Dolma: Validation, methodology, writing—reviewing.

Data Availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethical Approval Not applicable.

Consent to Participate Not applicable.

Consent to Publish Not applicable.

Conflict of Interest The authors declare no competing interests.

References

Babu RY, (2008). Action Research Report on Subhash Palekar"s "Zero Budget Natural Farming"

Kumar N, (2012). "Subash Palekar's zero budget no-till rice farming"

Murall, S. 2016. "Natural farming can rescue farmers", THE HINDU

Palekar S, (2014). http://www.palekarzerobudgetspiritualfarming.org/

Pawar VR, Tambe AD, Patil SP, Suryawanshi SU, (2013). Effect of different organic inputs on

yield, economics and microbial count of Sweet Corn (*Zea mays Var. Saccharata*). Eco. Environ. Conser. 19(3):865-868.

Saurabh Tripathi, Shruti Nagbhushan, Tauseef Shahidi. Zero Budget Natural Farming, for the Sustainable Development Goals, Andhra Pradesh, India, 2018.

How to cite this article:

Jigmet Yangchan and Tsering Dolma. 2025. Natural Farming is A Boon Against Sustainable Agriculture in Cold Arid Desert in Changthang. *Int.J.Curr.Microbiol.App.Sci.* 14(03): 37-42.
doi: https://doi.org/10.20546/ijcmas.2025.1403.007