



## STATUS AND POTENTIAL OF ORGANIC FARMING IN HIGH ALTITUDE COLD ARID REGION-LEH (LADAKH): A SURVEY

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### ABSTRACT

Leh district is situated between 31-36°N latitude and 76-80° E longitude with an altitude ranging from 2500 to 6000 m above mean sea level. Leh is the largest district in the country with an area of 45,100 Km<sup>2</sup>. Agriculture is the main occupation of the rural people of the district. LAHDC and some NGOs like LEHO and LEDEG plays a major important role in switching farmers towards organic agriculture in Ladakh. It was observed that rural traditional farming in Ladakh is purely based on organic inputs such as Night soil, FYM, manual weeding, plugging off the diseased plant etc.

**KEY WORDS:** Leh, NGOs, Organic agriculture, Night soil, FYM.

### INTRODUCTION

The cold arid region of Ladakh covers about 24,205 ha of cultivated area. The soils of the region are coarse textured, shallow, sandy, derived from weathered debris of rocks, subjected to severe wind erosion, have high permeability, low water holding capacity and low organic carbon (Sharma 2000). Leh is situated in the trans-Himalayan cold arid region and lies between 32°-36° N latitude and 76°-79°E longitude at an altitude of 11,300 to 18,000 ft. above MSL (Sharma 2000). Cultivated area under Leh district is 12,058 ha, where barley (*Hordeum vulgare*), wheat (*Triticum aestivum*) and alfalfa (*Medicago sativa*) are major crops (Chaurasia and Singh, 1996), which cover 83% of the total cultivated area. In recent years, the people of this region have been health conscious and diverted to organic agriculture. This may be due to paying high price for organic produce by the foreigners. Hence, an attempt was made to assess the status of organic farming in Leh district. Organic farming is the form of agriculture that relies on techniques such as crop rotation green manuring, compost & biological pest control to maintain soil productivity & control pests. Organic farming uses bio

fertilizers & pesticides but strictly excludes or limits the use of manufactured (Synthetic) fertilizers, pesticides (which includes, insecticides & fungicides). Organic agriculture is a production system that sustains the health of soils, ecosystems and people.

### MATERIALS & METHODS

Leh has an extremely harsh environment and one of the highest and driest inhabited places on earth (Fig. 1). Leh's climate is referred to as a "cold desert" climate due to its combined features of arctic and desert climates. These include wide diurnal and seasonal fluctuations in temperature, from -40°C in winter to +35°C in summer, and extremely low precipitation, with an annual 10cm to 30cm primarily from snow (Demenge, 2006). Due to high altitude and low humidity, the radiation level is amongst the highest in the world (up to 6-7 Kwh/mm). The soil is thin, sandy and porous. These combined factors explain why the entire area is nearly devoid of vegetation, with the exception of valley floors and irrigated areas (Demenge, 2006).



**FIGURE 1:** Map of Leh district (Ladakh)

The survey on the status of underexplored organic farming practices was conducted in Leh district of J & K. Three well-known organic villages from Leh district (Takmachik, Skurbuchan and Saboo) which are located around the famous river, *Indus* were purposively selected and the investigations were made through multiple field visits, questionnaires and interviews with elderly people.

## RESULTS & DISCUSSION

The details of the present investigation carried out to view the status of organic farming in high altitude cold arid zone- Leh (Ladakh) is presented hereunder.

Having realized their ill effect of using pesticides & other chemical which cause damage to the ecosystem, farmers in Ladakh's region have switched to organic farming to avoid the usage of pesticides, the farmers are attempting to use the land in such a way that it can be reused which is not always possible when agriculture is too chemically dependent. With the help of Ladakh Autonomous Hill development Council (LAHDC) and some NGOs like LEHO (Ladakh Environment and Health Organization) and LEDEG (Ladakh Ecological Development Group), farmers of Ladakh from last five years are more conscious about using organically based product. These NGOs and Department of Agriculture gave farmers training and

demonstrate them to build Compost pits and how to make organic manure. Besides that, they also provide subsidy to the farmers in order to boost organic farming. The youngsters in Ladakh are increasingly switching to more profitable organic farming rather than using chemical fertilizers, pesticides etc.

### Organic inputs in Ladakh

#### *Compost Toilet and Night soil*

The Ladakhi compost toilet is the traditional system that has served the people, land, and agriculture well for centuries. Unlike Western style flush toilets that consume and pollute precious fresh water and in the process carry away and waste a valuable natural fertilizer, Ladakhi toilets (Fig. 2) are based on the concept that human 'waste' is not waste at all, since it is recycled into compost for use on agricultural fields as *Night soil* (Sharma and Mir, 2000). No fresh water is consumed or polluted in the process, and only natural materials are used to mix with the feces and urine and let sit until the process of decomposition has yielded a rich fertilizer.

It is important to remember to cover your deposit with a shovel-full or two of soil or whatever other material may be provided after you are finished.



**FIGURE 2:** Ladakhi compost toilet

#### *Farmyard manure*

Farmers in Ladakh rear domestic animals like cows, *Dzo*, Yak, sheep and famously known pashmina goats *etc.* (Sharma and Mir, 2000) and poultry birds in a sustainable way. The fecal matter of these animals is deposited along with field soil for decomposition and the final product is used in the fields at the time of field preparation which we called Farmyard manure (FYM) or locally known as *Nying-Ludd*.

#### *Weeding*

Weed management in Ladakh is carried out twice after sowing of the crop upto harvesting (Sharma and Mir,

1997). Women used a flat-hook type tool locally known as *Purcha* to dragged or plug out the weed along with roots and lying it on the upper surface which will later decompose and supplement important nutrients to soil.

## CONCLUSION

1. Organic farming leads us to sustainable agriculture.
2. It is environmental friendly.

3. Nature friendly without eroding the soil fertility
4. Getting high price for organic produce due to health conscious.
5. It reduces soil pollution and produces crops of superior quality.

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