Himalayan Climate Change Adaptation Programme (HICAP)

Preparation of Jholmal in RMV Pilot Sites

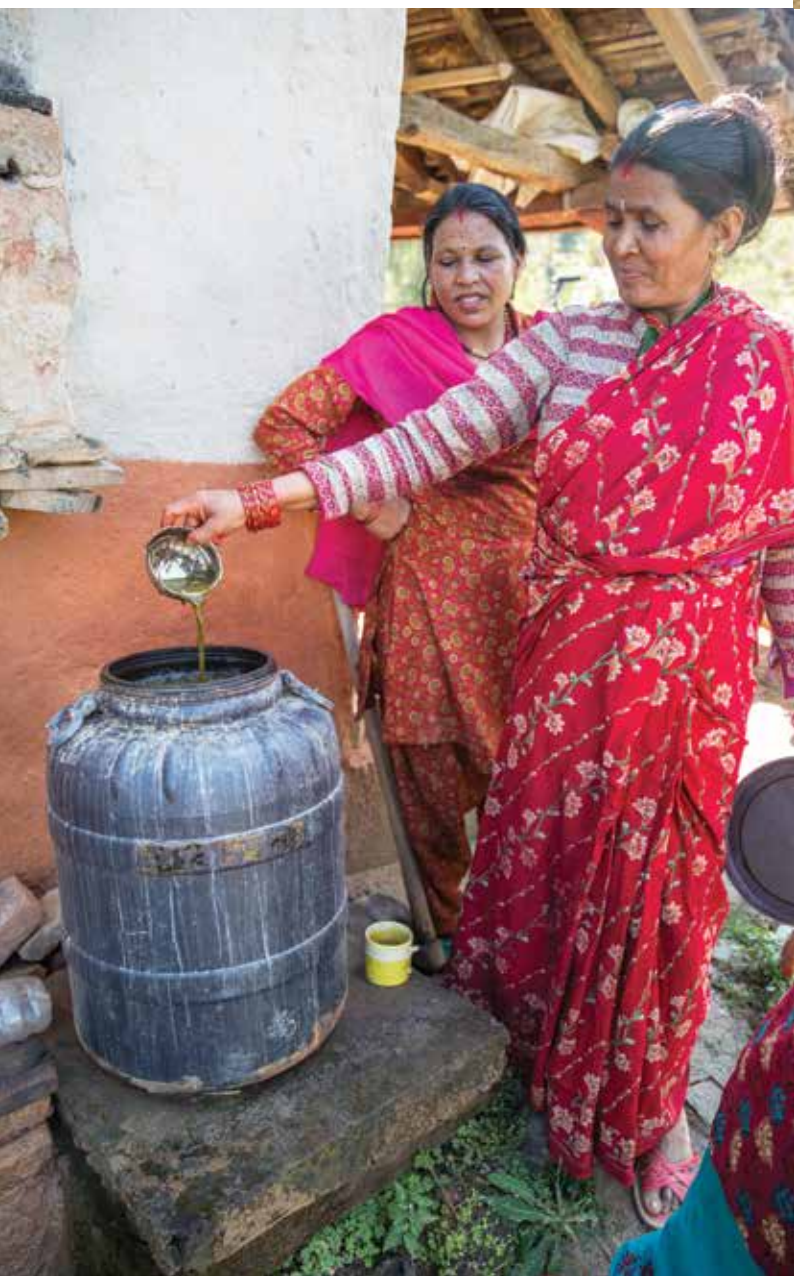
Upscaling a local practice

CEAPRED

ICIMOD

FOR MOUNTAINS AND PEOPLE

Jholmal is a homemade biofertilizer and biopesticide that helps improve crop yields while lowering costs for farmers and reducing the use of harmful chemicals. It is prepared by mixing and fermenting locally available material – animal urine, water, microorganisms, farmyard manure, and plants – in a defined ratio. It controls insect pests which attack and damage crops, protects crops against fungal and vector borne diseases, and supports improved plant health. In villages where its use was demonstrated, all households were convinced to adopt it. While Jholmal is based on a local traditional practice, CEAPRED and ICIMOD are exploring the possibilities, through extensive research, to enhance its usage and recommend crop specific mixtures and usages.



How it works

Ingredients

Animal urine plays a part both as a fertilizer and a pesticide. It contains nutrients – nitrogen, potassium and phosphates – as well as antibacterial, antioxidant, anthelminthic, antibiotic (like quinolone, rifampicine or tetrocytine) and antifungal agents.

Jeevatu™ is a mix of beneficial microbes, found in natural conditions, which play a part in plant nutrition and protection. They also act as catalytic agents that accelerate the decomposition process. This solution is non-poisonous and harmless to ecosystems. The key ingredients of Jeevatu™ are lactic acid bacteria, Azotobacter and Trichoderma species, Phosphate solubilizing bacteria (PSB), Potassium solubilizing bacteria (KSB), photosynthetic bacteria, and yeast. Jeevatu™ is manufactured in Nepal under the technical guidance of the Nepalese Farming Institute. If unavailable, it can be left out, or replaced by other effective microorganisms.

Farmyard manure contains macro- and micronutrients required by plants. These nutrients are more readily available to plants in the form of liquid manure (Jholmal–1) than in solid manure.

Locally available plant material with different odours and tastes have properties that repel or kill various insect pests or diseases.

Making Jholmal

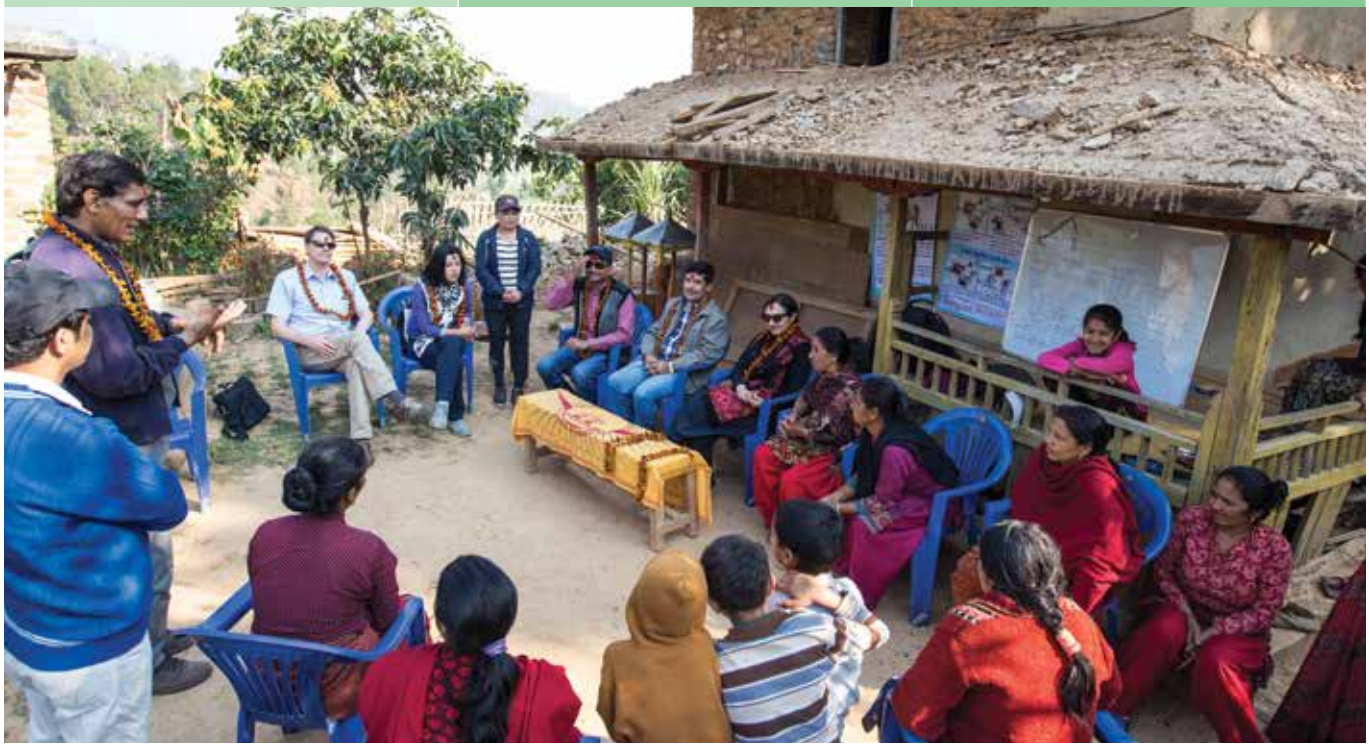
- Mix urine, water, Jeevatu™ and possibly solid elements
- Wait a few weeks until the odour changes and a green colour appears
- Filter if needed (for Jholmal–3)

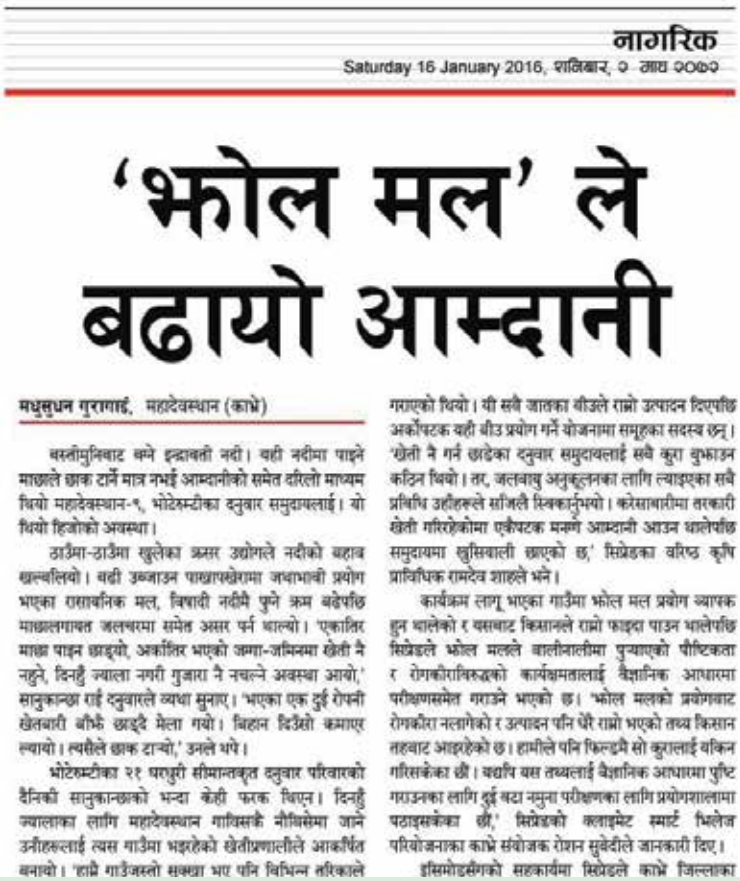
JHOLMAL RECIPES		
Jholmal–1	**Jholmal–2**	**Jholmal–3**
In 50 litre drum, mix:		
17 kg well-decomposed cow dung/ farm yard manure	No solid component	Chop the leaves and stems of locally available plants with bitter, sour, or pungent taste (see list below), and fill in the drum
+ 16 litres of cow/buffalo urine	24.5 litres of cow/buffalo urine	Fill up the drum with equal amounts of cow/buffalo urine and water
+ 16 litres of water	+ 24.5 litres of water	
+ 1 litre Jeevatu™	+ 1 litre Jeevatu™	+1 litre of Jeevatu™
Wait (Wait times depend on the temperature: the warmer the ambient air, the shorter the wait time) Times given here correspond roughly to temperatures between 15–30°C		
15 days	**15 days**	**21-30 days**
When Jholmal–1 is ready, the smell of compost disappears and a green colour appears at the top of the liquid.	When Jholmal–2 is ready, the smell of urine disappears and a green colour appears at the top of the liquid.	The solution will have a strong odour of rotten leaves because of the decomposition of plant material.
Texture when ready: slurry	Texture when ready: liquid solution	Jholmal–3 will be used in liquid form. Further processing is thus needed at this stage to separate the liquid part (for use as pesticide) from the solid components.
Filtering		
No filtering required	No filtering required	Filter using cotton cloth. The liquid obtained is Jholmal–3.

Use

- Dilute the Jholmal preparation in water
- Apply it by either pouring on soil at the base of the plant (Jholmal–1) or spraying on leaves and stems (Jholmal–2 and Jholmal–3)
- Jholmal provides benefits as pesticide (all recipes) and fertilizer (Jholmal–1)

USING JHOLMAL		
Jholmal–1	**Jholmal–2**	**Jholmal–3**
Mix together		
3 litres of water	3 litres of water	3-6 litres of water, depending on the age of the plants: For younger plants (less than 3 weeks old), which are tender, use a solution diluted with 6 litres of water. Gradually lower the amount of water to 3 litres as the plants get older.
1 litre of Jholmal–1 slurry	1 litre of Jholmal–2 solution	1 litre of Jholmal–3 solution
* If there is high incidence of soil borne pests or insects, use 1 litre of water mixed with 1 litre of Jholmal–1.	* If there is high incidence of insect pests, use 1 litre of water mixed with 1 litre of Jholmal–2.	* If there is high incidence of insect pests, use 1 litre of water mixed with 1 litre of Jholmal–3.
** This should be reserved to severe cases, to get quick control over the fast spreading insects or diseases, and is not encouraged in normal conditions.*		
Application		
Pour the slurry directly on the soil at the bottom of the plants (root zone).	Spray the solution on the plant, covering the leaves and stems.	Spray the solution on the plant, covering the leaves and stems.
Effects		
Biofertilizer and biopesticide for soil borne insect pests	Biopesticide	Biopesticide
This slurry contains large quantities of the main macronutrient required by plants.	This solution is effective at repelling, preventing, and controlling many pests and diseases of cereal and vegetable crops.	Works as an insecticide and insect repellent.





नागरिक

Saturday 16 January 2016, शनिबार, १ माघ २०७२

'झोल मल' ले बढायो आम्दानी

मधुसुधन गुरागाई, महादेवस्थान (काभ्रे)

बसौंटीनिवाट बग्ने इन्द्रावती नदी। यही नदीमा पाइने माछाले छाक टार्ने मात्र नभई आम्दानीको समेत दरिलो माध्यम थियो महादेवस्थान-९, भोटेकम्टीका दनुवार समुदायलाई। यो थियो हिजोको अवस्था।

ठाउँमा-ठाउँमा खुलेका क्रसर उद्योगले नदीको बहाव खल्बलियो। यही उथ्लाउन पाखापखेरामा जथाभावी प्रयोग भएका रासायनिक मल, विषादी नदीमै पुगे क्रम बढेपछि माछालगायत जलचरमा समेत असर पर्न थाल्यो। 'एकातिर माछा पाइन छाड्यो, अर्कातिर भएको जग्गा-जमिनमा खेती नै नहुने, दिनहुँ ज्यालाा नगरी गुजारा नै नचल्ने अवस्था आयो,' सानुकान्छा राई दनुवारले व्यथा सुनाए। 'भएका एक दुई रोपनी खेतबारी बाँझै छाड्दै मेला गयो। बिहान दिउँसो कमाएर ल्यायो। त्यसैले छाक टार्यो,' उनले थपे।

भोटेकम्टीका २१ घरधुरी सीमान्तकृत दनुवार परिवारको दैनिकी सानुकान्छाको भन्दा केही फरक थिएन। दिनहुँ ज्यालाका लागि महादेवस्थान गाविसकै नौविसेमा जाने उनीहरूलाई त्यस गाउँमा भइरहेको खेतीप्रणालीले आकर्षित बनायो। 'हामी गाउँजस्तो सक्खा भए पनि विभिन्न तरिकाले गराएको थियो। यी सबै जातका बीउले राम्रो उत्पादन दिएपछि अर्कोपटक यही बीउ प्रयोग गर्ने योजनामा समूहका सदस्य छन्। 'खेती नै गर्न छाडेका दनुवार समुदायलाई सबै कुरा बुझाउन कठिन थियो। तर, जलवायु अनुकूलनका लागि त्याइएका सबै प्रविधि उहाँहरूले सजिलै स्विकार्नुभयो। करेसाबारीमा तरकारी खेती गरिरहेकोमा एकैपटक मनग्गे आम्दानी आउन थालेपछि समुदायमा खुसियाली छाएको छ,' सिप्रेडका वरिष्ठ कृषि प्राविधिक रामदेव शाहले भने।

कार्यक्रम लागू भएका गाउँमा झोल मल प्रयोग व्यापक हुन थालेको र यसबाट किसानले राम्रो फाइदा पाउन थालेपछि सिप्रेडले झोल मलले बालीनालीमा पुऱ्याएको पौष्टिकता र रोगकीराविरुद्धको कार्यक्षमतालाई वैज्ञानिक आधारमा परीक्षणसमेत गराउने भएको छ। 'झोल मलको प्रयोगबाट रोगकीरा नलागेको र उत्पादन पनि धेरै राम्रो भएको तथ्य किसान तहबाट आइरहेको छ। हामीले पनि फिल्डमै सो कुरालाई थकिन गरिसकेका छौं। यद्यपि यस तथ्यलाई वैज्ञानिक आधारमा पुष्टि गराउनका लागि दुई वटा नमुना परीक्षणका लागि प्रयोगशालामा पठाइसकेका छौं,' सिप्रेडको कलाइमेट स्मार्ट भिलेज परियोजनाका काभ्रे संयोजक रोशन सुबेदीले जानकारी दिए।

इसिमोडसँगको सहकार्यमा सिप्रेडले काभ्रे जिल्लाका

"Jholmal has increased income", an article by Madhusudhan Guragain, was published in Nagarik, a national daily in Nepal, on 16 January 2016. The article chronicles how farmers in Kavre are adopting Jholmal, improved compost, and vegetable farming. This change in practice can be observed in select villages in Kavre, where CEAPRED and ICIMOD have an undergoing pilot project, training farmers on water-smart, crop-smart and nutrient smart interventions. The farmers are happy with the training on climate smart agriculture, the added greenery and increase in income.

The article helped in driving adoption of Jholmal and other technologies introduced in the pilots.

Plants used in Jholmal–3

Locally available plants with a bitter, sour, or pungent taste/smell are used to prepare Jholmal–3. Below is a list of suggestions for such plants available in the mid-hills of Nepal.

English Name	Nepali Name	Botanical Name	Parts Used
Malabar Nut	Asuro	*Justicia adhatoda*	Leaves
Stinging Nettle	Sisnoo	*Utica dioica*	Leaves and stem
Mugwort	Titepati	*Artimesia vulgaris*	Leaves and stem
Persian lilac	Bakaino	*Melia azedarach*	Leaves and fruits
Indian lilac	Neem	*Azadirachta indica*	Leaves and fruits
Marigold	Sayapatri	*Tagetes erecta*	Leaves and stem
Peach	Aaru	*Prunus persica*	Leaves
Century Plant	Ketuki	*Agave americana*	Stem
Tallow Tree	Khirro	*Sapium insigne*	Leaves
Siam weed	Banmara	*Chromolaena odorata*	Leaves and stem
Ginger	Aduwa	*Zingiber officinale*	Underground rhizome
Chilli	Khursani	*Capsicum frutescens*	Fruit
Garlic	Lahsun	*Allium satira*	Underground rhizome
Onion	Pyaj	*Allium cepa*	Underground rhizome
Sichuan pepper	Timur	*Zanthoxylum simulans*	Seed

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