

Chaupal



Funded by the European Union



TEEB Agrifood

The Economics of Ecosystems and Biodiversity for Agriculture and
Food Initiative in India, Uttarakhand

FOREWORD

The Economics of Ecosystems and Biodiversity (TEEB) is a global initiative focused on 'making nature's value visible' with the aim to mainstream the tangible and intangible values of biodiversity and ecosystem services into decision-making at all levels. The TEEB framework offers a structured approach to valuation to help recognize the wide array of benefits provided by ecosystems and biodiversity, demonstrate their values in economic terms and, where appropriate, capture those values in decision-making.

The EUPI funded TEEB for Agriculture and Food (TEEBAgriFood) Initiative is currently being implemented in seven countries including Brazil, China, India, Indonesia, Malaysia, Mexico and Thailand and focuses on capturing positive and negative impacts across the entire agri-food value chain. The evaluations will support decision-making in both agri-food linked public and private sectors on the impacts of decisions on natural, social, human, and produced capital through scientific evidence. In India, the TEEBAgriFood application covers the assessment of Organic Farming and Agroforestry in three states- Uttarakhand, Uttar Pradesh, and Assam, assessing the value of tangible and intangible costs and benefits of scaling organic farming and agroforestry in the states.

G.B Pant University of Agriculture and Technology (GBPUAT), as the lead research partner in Uttarakhand is conducting the assessment under the TEEBAgriFood Initiative, funded through the European Union Partnership Instrument (EUPI) and hosted by the UN Environment Programme. This comic has been produced by the Office of the Director, Extension Services, GBPUAT to draw attention to the many visible and invisible benefits of organic farming and agroforestry, those that can often be disregarded when decisions to increase agriculture productivity are taken.

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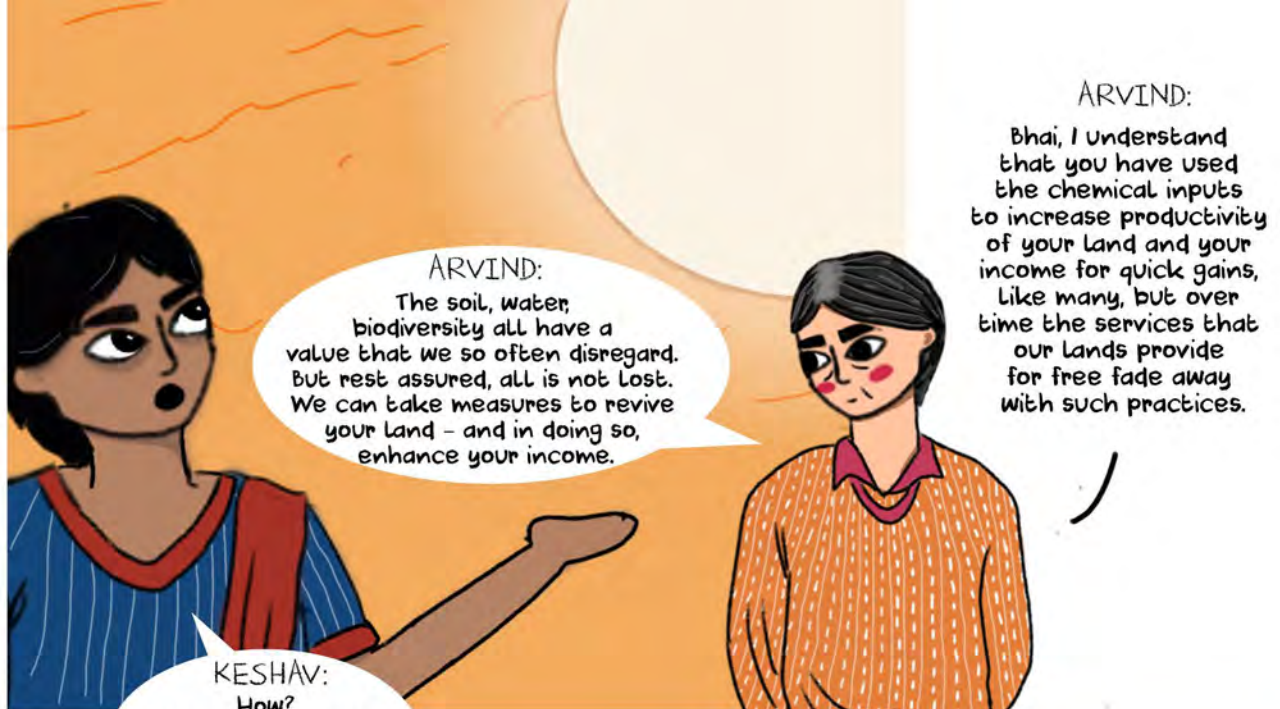
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For more information on TEEB, please visit: <https://teebweb.org>

VALUING THE ESSENTIALS





ARVIND:
The soil, water, biodiversity all have a value that we so often disregard. But rest assured, all is not lost. We can take measures to revive your land - and in doing so, enhance your income.

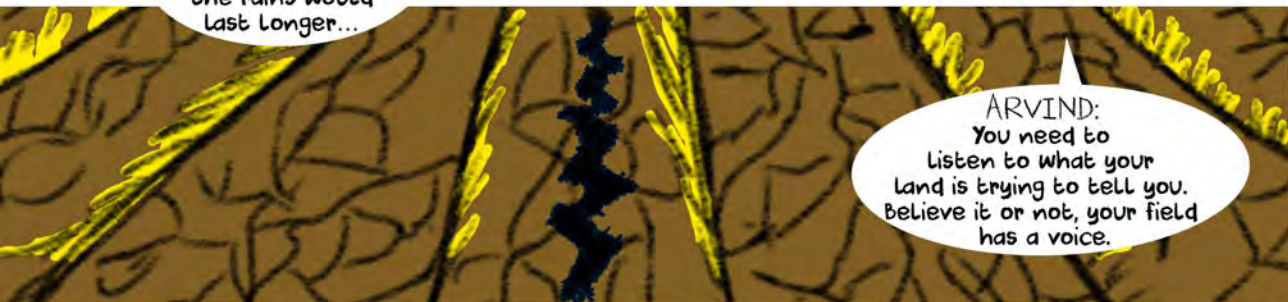
ARVIND:
Bhai, I understand that you have used the chemical inputs to increase productivity of your land and your income for quick gains, like many, but over time the services that our lands provide for free fade away with such practices.

KESHAV:
How?
The rain patterns have also been so inconsistent in the past two years.



ARVIND:
You know how it's been these days. Rainfall is so unpredictable. We need to adopt practices that will help conserve water. Like soil, water too has a value that we so often disregard. Why didn't you start rain water harvesting even after the government provided means to collect rainwater?

KESHAV:
I don't know, Bhaiya. I thought the rains would last longer...



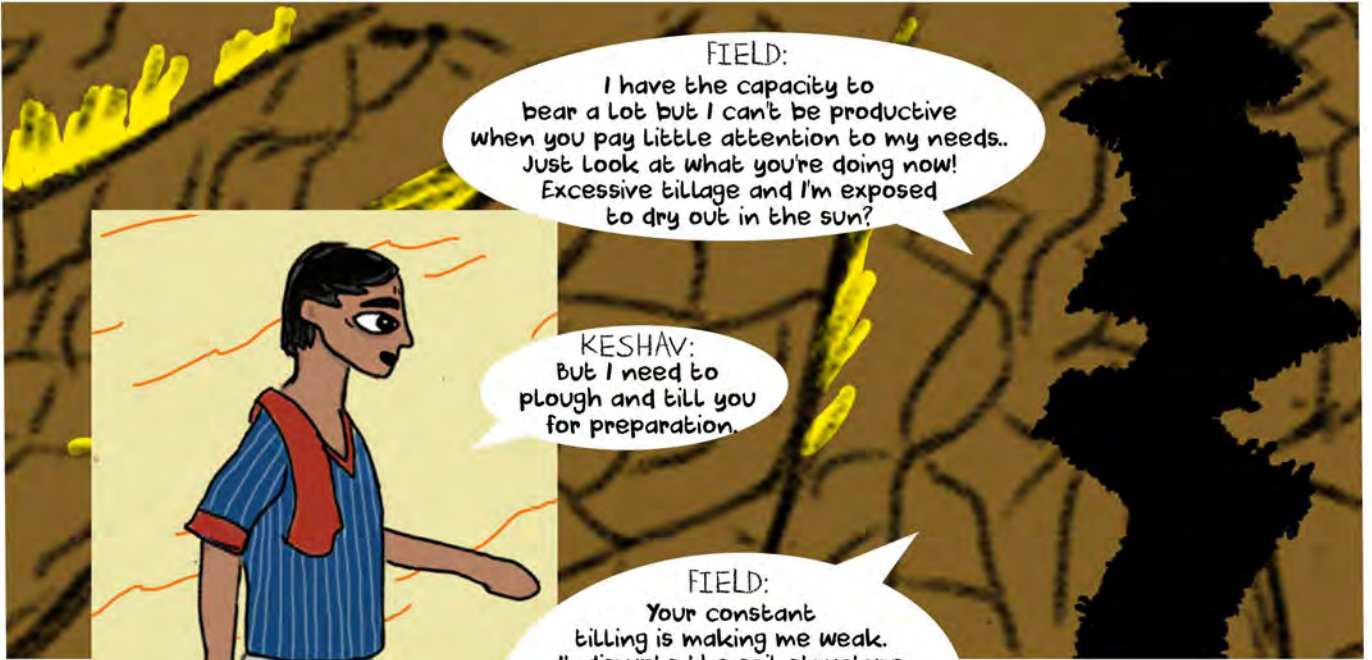
ARVIND:
You need to listen to what your land is trying to tell you. Believe it or not, your field has a voice.

KESHAV:
WAIT, WHAT?!



FIELD:
Yes, finally someone to knock some sense into him.





FIELD:
I have the capacity to bear a lot but I can't be productive when you pay little attention to my needs.. Just look at what you're doing now! Excessive tillage and I'm exposed to dry out in the sun?

KESHAV:
But I need to plough and till you for preparation.

FIELD:
Your constant tilling is making me weak. It disrupts the soil structure leading to soil erosion. My suggestion is to limit the frequency of ploughing and breaking only the top crust since digging deep is fatal to me.



And considering the erratic weather, how will my Brother Soil stand such unpredictable weather when his health already deteriorating? Right, Brother Soil?



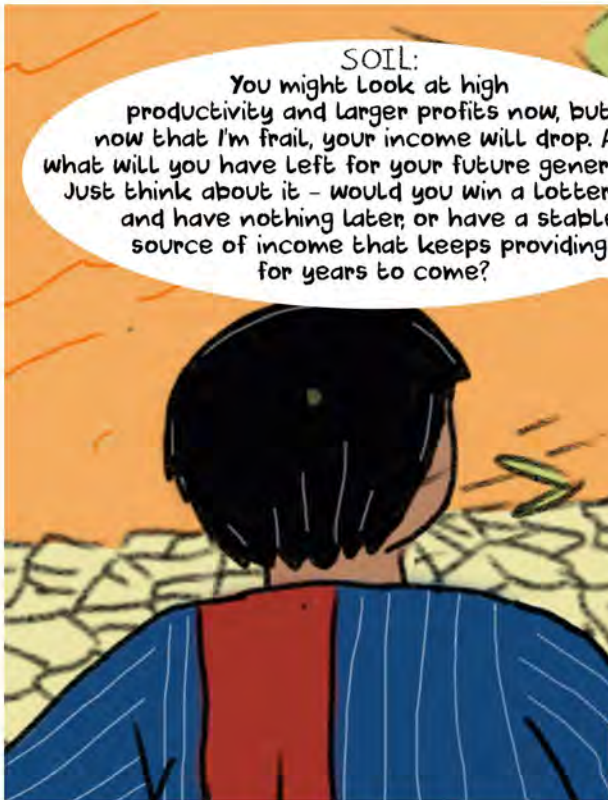
SOIL:
Oh brother field, I don't have the energy to speak much but it is important I do.



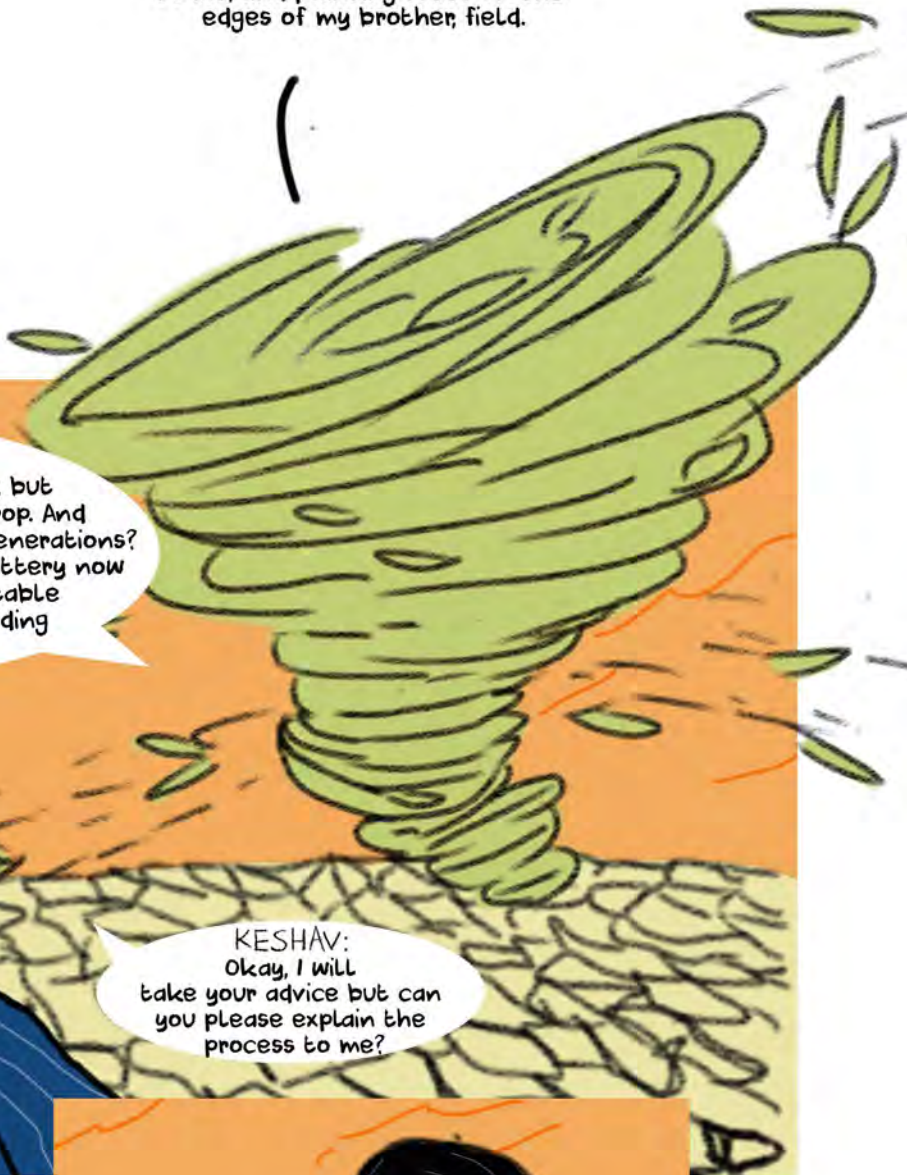
KESHAV:
But this is a rather long process. What is my immediate solution?

SOIL:

Look, Keshav, it is no secret that I have become less fertile because of the nutrients being washed away with soil erosion. And have you walked down to the lake? - All the sediment and nutrients are being collected there, polluting your water. Do you know how much it costs to rejuvenate the lake? So my suggestion would be to start paying a little more attention to our needs - you could start by cover cropping, bio-mulching, adding compost to me, and planting trees on the edges of my brother's field.



SOIL:
You might look at high productivity and larger profits now, but now that I'm frail, your income will drop. And what will you have left for your future generations? Just think about it - would you win a lottery now and have nothing later, or have a stable source of income that keeps providing for years to come?



KESHAV:
Okay, I will take your advice but can you please explain the process to me?

Cover cropping is like putting on clothes to provide physical safeguards to the body. I need to be healthy for you to be able to have a good harvest. Also, you can grow trees along the bunds of brother's field - it's a form of agroforestry that can reap many benefits.



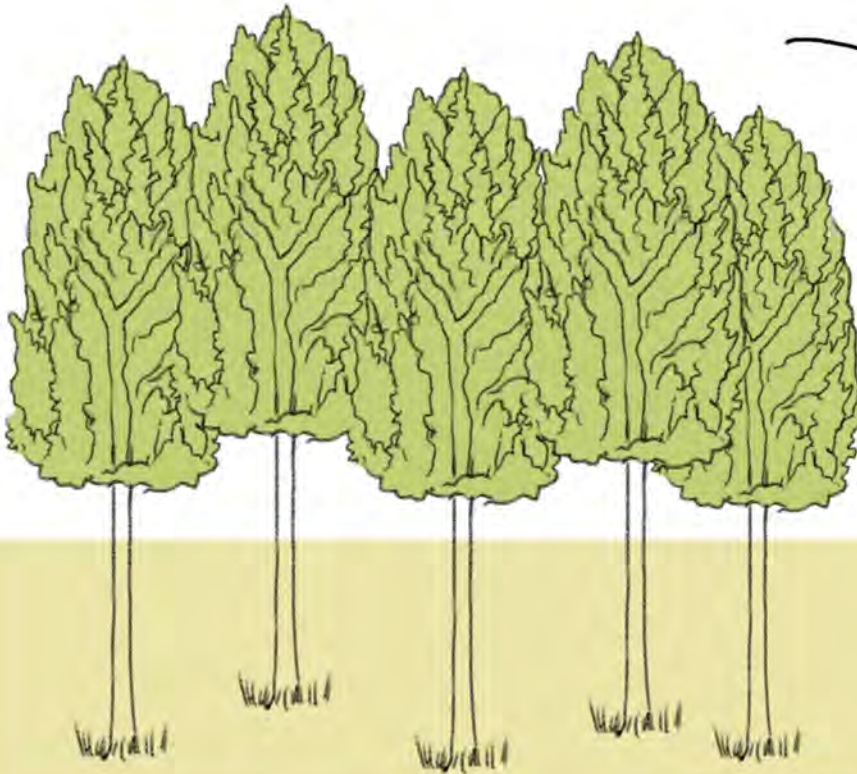
KESHAV:
Benefits? What benefits?



SOIL:
Yes, Mr. Poplar on the corner of the field, it's time for you to explain what benefits you provide. You must become more popular than what you currently enjoy.

MR POPLAR:

Oh, Keshav, do you know my fast growth and extensive root system help stabilize the soil, preventing erosion and retaining moisture. Now imagine there were more of me along your bunds or on your field, how much more soil, nutrients and moisture I could conserve. But that's not all, there are multiple benefits of growing me or my cousins, Eucalyptus, Bhimal and even the lanky fellow Bamboo.



KESHAV:
I wasn't aware of this.



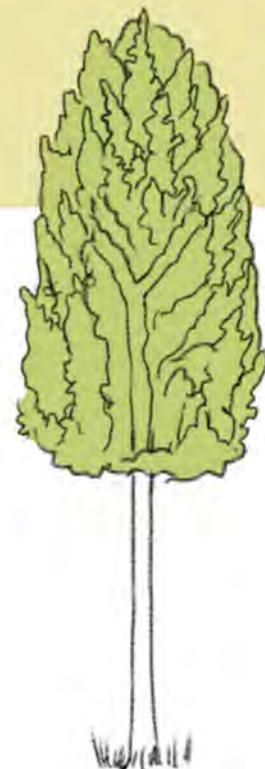
ARVIND:
Keshav do you know that I have planted several trees along the bunds and in one field I have also taken up fruit-tree based agroforestry. The trees have brought me multiple benefits providing income through the sale of timber, fruits, firewood.

Trees like poplar and shisham have the potential for timber sales, providing valuable wood products for the paper, construction and furniture industries. Some of these products are exported also, generating more income for all of us. We can also grow medicinal trees and those which give green fodder for our animals

MR POPLAR:

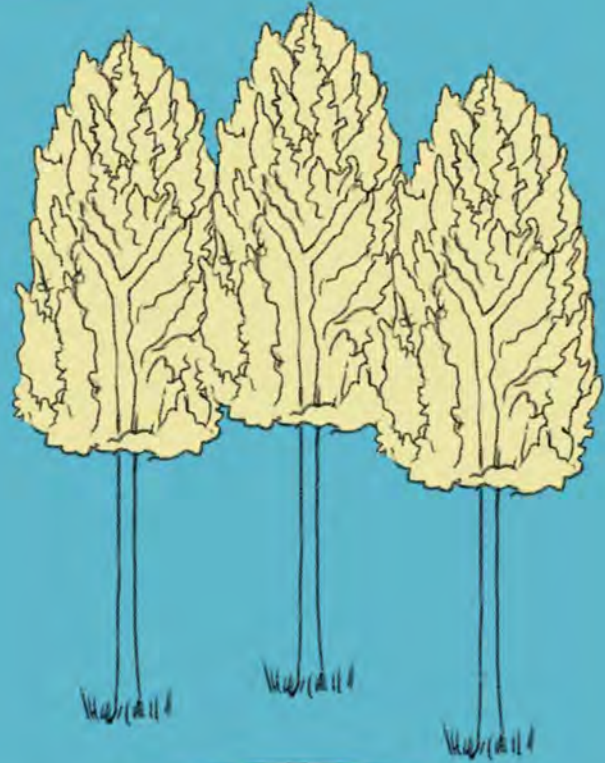
Oh, do you also know that my friends and I protect undergrowth including crops from extreme climatic events and serve as a welcoming haven for vital pollinators like birds and insects?

And here's something even more exciting! I help sequester carbon dioxide and combined with all my friends in fields and in forests, the amount of carbon we remove is combating climate change. And you know that removing carbon through planting more of us can bring you more income?

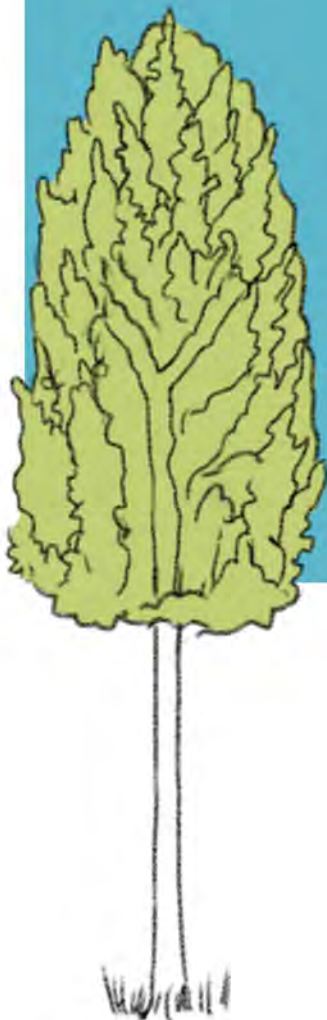




KESHAV:
Wow, I had no idea.
This way I can have more
than one source of income that
will make me more resilient
to crop losses.



AIR:
Sorry to interrupt
but this conversation is
getting really exciting. Mr. Poplar
can I give you a hug? We need more of
you. And look I have breezed through the
village and see there are potential
opportunities to use wastelands
for growing many more just
like you, Mr. Poplar.



KESHAV:
Wow, you all are
so intelligent. Thank you so
much for teaching me
about your value that we
often disregard.
I will make sure I am
more attentive
to your needs.



SHIELD IN THE FIELDS





SAVITA:
Oh, Look Raj, Look at Savita behen's fields - how come the crops are still standing and are thriving under such conditions? Let's go and meet her.



RAJ:
Hello Savita, we are wondering what you doing in your fields? Look at your crops - they have not been destroyed by the heavy rainstorms like ours. And your soil looks healthy too!



RAVI:
We have Lost all our crop for this season and have nothing to sell. Our savings are also running out!

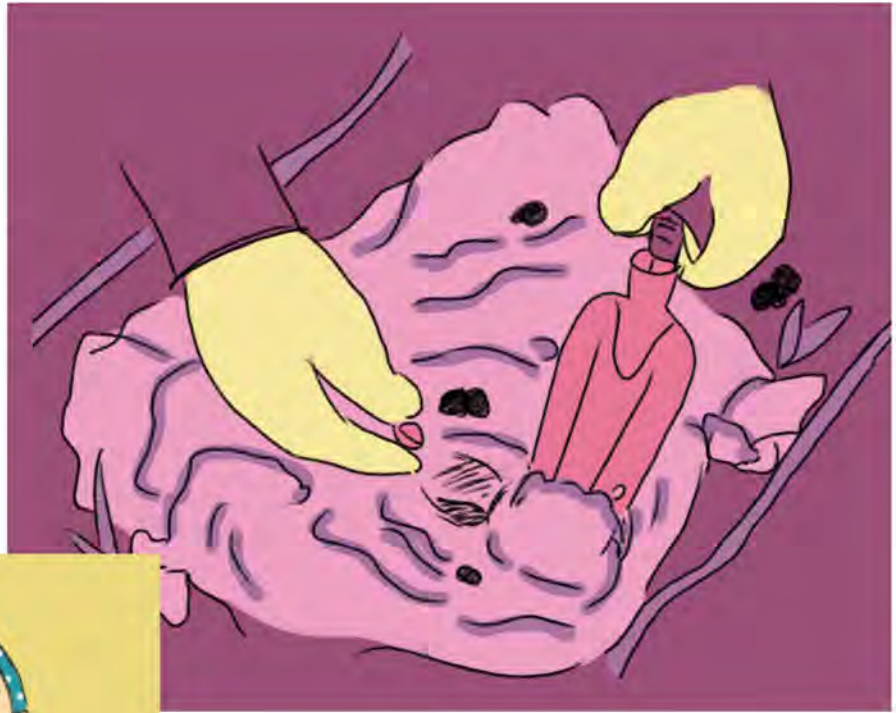


SAVITA:
Oh Raj, Ravi - I'm sorry to hear of the Loss. But don't worry - Look at this as an opportunity to adopt some of these practices that I have been using. I am also really amazed at how this has turned fortunes for me.

RAJ & RAVI:
How is that possible?
We were both struck by the storm. Why are we the ones suffering more? Do we have bad Luck?

SAVITA:

No, it's not a matter of Luck. Remember when everyone sowed only rice and wheat in the year with no crops in between? I planted a mixture of Legumes, grasses, and other cover crops in that window.



SAVITA:

I planted cover crops and left those to decompose. That helped revive my soil structure, making the soil less vulnerable to soil erosion during heavy rain storms. It has also improved nutrients in my field and overtime, I have also reduced my expenditure on fertilisers especially urea.

RAJ & RAVI

No wonder you have already repaired the damages to your house and the money you have saved this season. Our roof stands damaged and we do not even know when we can repair it.



SAVITA:

I hope you will be able to recover soon. Give some of these methods I have employed a try - you can at least convert a portion of your field. Over the years, my method of cover cropping has also helped me increase my crop yields, reduce machinery cost, break pest cycles and attract pollinators, saving money on agricultural inputs and adding to my overall income. The trees around the fields also serve as a wind break during storms, while I get additional income from their produce too

RAJ & RAVI:
Hmm, How can we start?

SAVITA:
Start today. Come with me to the Krishi Vigyan Kendra and they will guide you.





MILLETS & CORN THIS TIME!

CHETAN:
Papa, can we
grow millet and corn
this time on the
land?

CHINTAN:
No! This family
land has an ancestral
tradition of growing rice and
wheat and it will
remain this way.



CHETAN:
But remember
what happened when
we were struck with
untimely rains last year?
We went into a loss.
Moreover, summer rice
is a banned concept,
Papa. It is one of the
major reasons for the
water table crisis
in our area.

CHINTAN:
What do
you mean?





CHETAN:
Growing same crop over and over again is harmful for our land. It leads to the buildup of pests and since those pests are familiar with the crop, they will attack it continuously because there are no other crops being grown.

So even the rice we grow is not the best quality. And our methods of growing rice also require lot of water, incurring cost on diesel or electricity for running the pumps. The ground water is also reducing every year.



CHINTAN:
No! Only this time it was not good.

CHETAN:
No, it's not just the pests. When you grow only one kind of crop, it upsets the natural balance of the soil. Besides that it also decreases crop yield, associated biodiversity, impacts our water and soil quality. The approach that we should take is one which does not weaken the crop and helps our land to keep giving back to us.

CHINTAN:
And what would that be?

CHINTAN:
How can you challenge the rice-wheat concept while you know that this is what helped feed so many during the green revolution?

CHETAN:
Papa, you know much better than me - you used to tell me how grandma used to make such mouthwatering millet dishes and you had all the strength in the world as a youngster. Lets diversify what we grow - plant crops other than just rice and wheat!



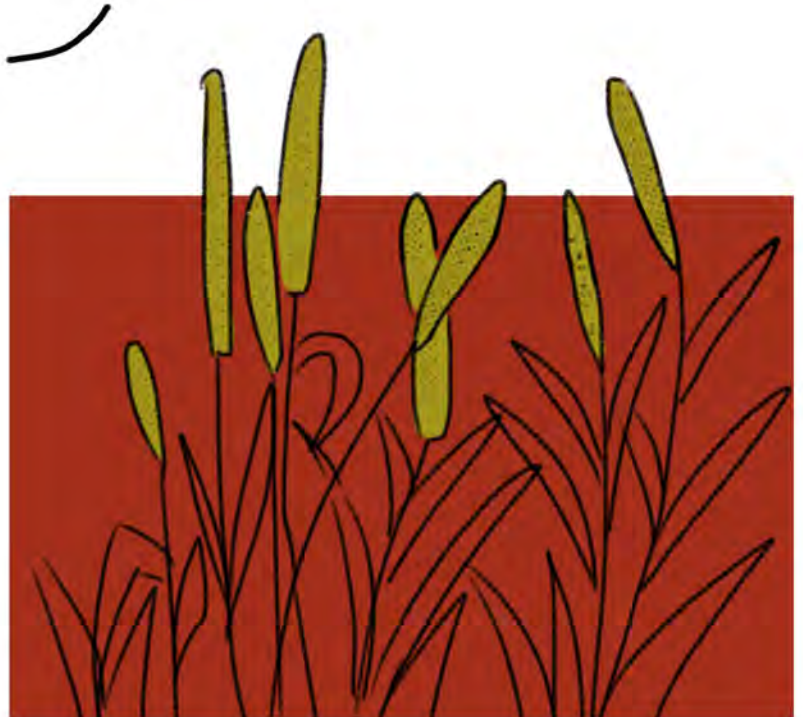


CHETAN:

Yes, it provided food security because that's what the country needed at the time. And what we need right now is different. The soil and water resources that we have right now isn't what it used to be, papa. Its the reason why our yield is also often low and our family income is impacted. And with how rapidly the climate is changing, who knows what is to come?

CHINTAN:

Will growing millets give us as much monetary benefit as we have received from rice and wheat cultivation?



CHETAN:

Organic millets and vegetables are in high demand right now. And you know 2023 is the International Year of Millets to bring back millets to the table and thereby increase demand and production. Considering the erratic weather change, they are a safe choice for us since they are climate resilient, and require less water and other inputs. Government is also promoting millets in a big way. Mother can make such tasty dishes from the millets we grow and these are more nutritious as compared to wheat and rice. The demand for organic millets is high in the cities as well and we will get good income

CHETAN:

My friend was telling me that there are government schemes like Rashtriya Krishi Vikas Yojana and Paramparagat Krishi Vikas Yojana that can help us get started. We can go and see my friend's field and visit our Krishi Vigyan Kendra to learn more about the schemes.

CHINTAN:
Chetan beta, are you sure we can undertake this when our income from our production is already declining?

CHINTAN:
Okay, I trust you

CHETAN:
Thank you, papa!



HEALTH HARVESTERS



DADI:
Savita, I am a little worried about Dev. He looks frail and does not seem to have the energy like other boys his age.



MA:
Ma - you know I've been very particular about making him eat our traditional meals. Over the last week you have seen that I've cooked up rajma, a whole variety of local, fresh vegetables and we have finger millet rotis at the table every day. And not to forget, the milk and eggs is what I put out for him every day!



DADI:
Then why is he not looking healthy?

Dev,
are you being a naughty boy?





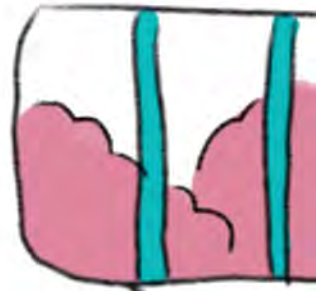
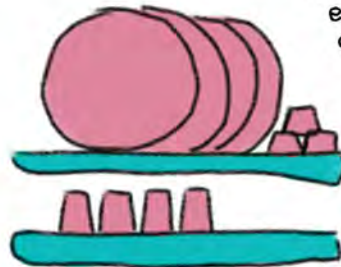
DADI:
Your ma
has been
working hard for
you to get
strong...



DADI:
...but if you are going to
continue eating that junk
food without proper
nutrition every day and not
enjoy your mother's home
cooked meals then how
will you grow strong?



DADI:
Huh? Tell me, Dev?



DADI:
If you don't grow strong,
then how will you take care of
them when they are older?
You do love them right?

DADI:
Arrey,
where are you
going now?





DEV:
How did
you become
so tall my
friend?

SUGARCANE:
You know a lot of it depends
on the right nutrition intake!

DEV:
Oh now I remember,
I was taught in my science class
that nutritional deficiencies are common these
days and we must maintain a balanced diet.
Ma and Dadi are right.





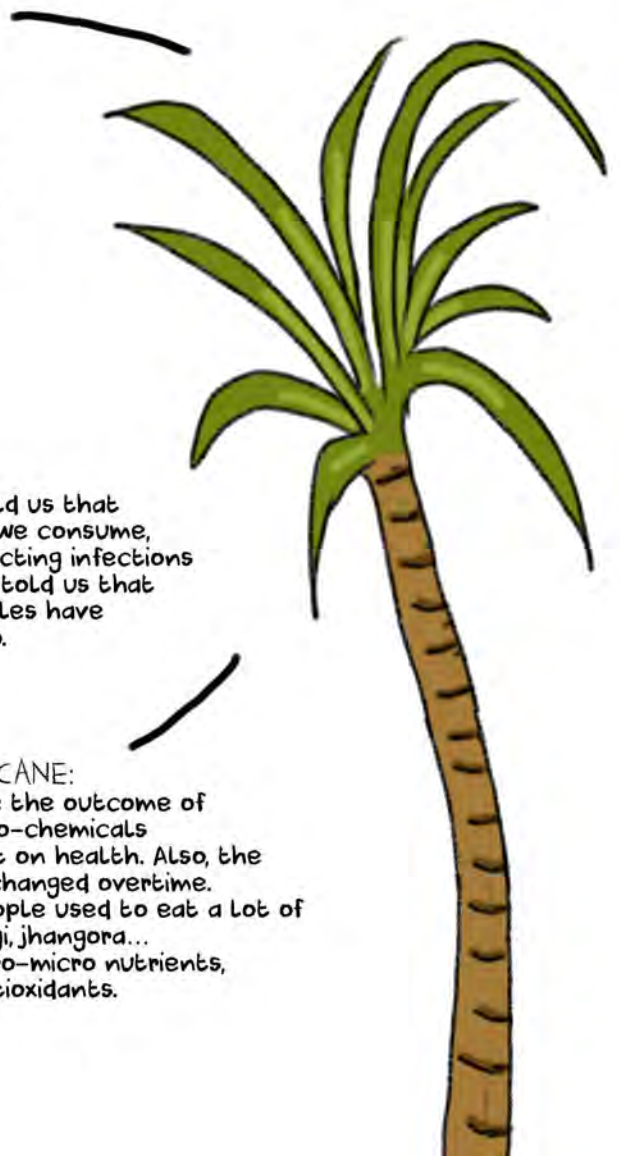
SUGARCANE:
Yes it does. We need good environmental conditions and soil management practices to thrive and grow strong but with the condition of land deteriorating, I and my fellow stalks do not have sufficient nutrients for uptake and to sustain our growth. Oh how I wish you could take up micro irrigation since at times I choke on the flooded water. And also the chemicals being sprayed on me are killing me inside though I may look fat and tall. The drop by drop water and organic food for me will be so good. So tell your friends that since you depend on us for your nutrition, if you feed us well and you can grow healthy too without pesticide in the juice, sugar and jaggery.



DEV:
Ah yes, our teacher also told us that the less nutritious food that we consume, the more prone we are to contracting infections with lower immunity. She also told us that organic fruits and vegetables have more nutrition too.



SUGARCANE:
You can only imagine the outcome of exposure of agro-chemicals in our food and its impact on health. Also, the food patterns have changed overtime. During your father's days, people used to eat a lot of millets like ragi, jhangora... which are high in macro-micro nutrients, fibre and antioxidants.

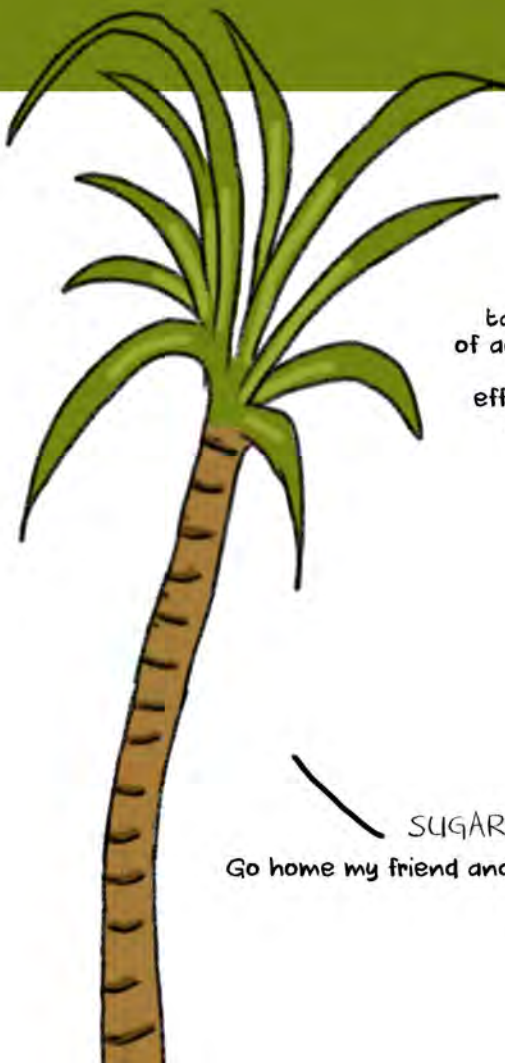




DEV:

Papa and ma have to spend so much more on medicines for me. I really need to start changing my habits and eat what ma cooks so that they don't have to spend so much on keeping me healthy. The more they save on my medical bills, the more money for our family.

But I don't see many ragi fields in our village these days. I must tell Papa, Ma and Ms. Teacher that we need to change this in our village.



SUGARCANE:

Bad habits are hard to break Dev - it will take some time for people to understand the many benefits of adopting sustainable agriculture, many benefits that are often unseen. I'm glad that the government is also making efforts towards convincing farmers to grow underutilized crops and promoting agroforestry and organic farming practices.

DEV:

Thank you friend. I have learnt that my choices can make an impact on my health, your health and my family's wellbeing. I also have learnt that the basis for wellbeing is taking care of the health of our resources.

SUGARCANE:

Go home my friend and spread the word.

THE NEW MOTHER INDIA

SAKHI:
That was such
a good film.

SHEILA:
We should do this often.
Just gather here and watch a
film once a month.



SAKHI:
Meena ji, can you come if we do
this next month as well?

MEENA:
I'll see...
I am actually
visiting Sarmoli for a
couple of months.

SAKHI:
Oh, what are you
doing there?





MEENA:
The women of Sarmoli have been practicing organic farming in their fields and they are also running community homestays to supplement their income.



MEENA:
I will be helping them out as they want to also be birding guides for the tourists that visit the village.



SHEILA:
But Radha, what has happened to you? Why are you looking so glum?



RADHA:
I was just wondering about the movie. Radha in the movie was the breadwinner for her family through agriculture. I feel very motivated and want to contribute positively to my farming as well considering the losses we faced last month.

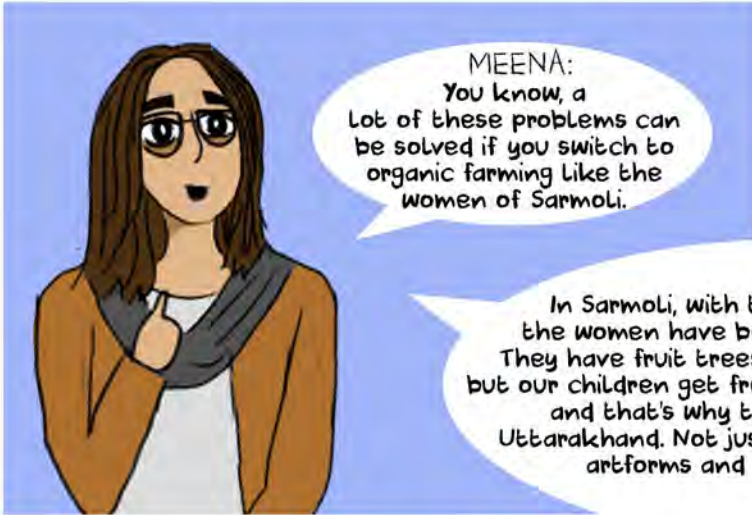
RADHA:
I wish I had more access and control to implement some of the things that Meena ji is talking about. It would be great for us to also have additional income from such activities.



SHEILA:
Yeah, I understand. I think I'm pretty much in your boat.



SAKHI:
Me, too. We need to mirror the life of Radha from the movie, Mother India - she was the breadwinner of the family in such harsh conditions. But even after so many years from when this movie was released, we haven't been able to be independent like her.



MEENA:
You know, a lot of these problems can be solved if you switch to organic farming like the women of Sarmoli.

MEENA:
In Sarmoli, with the help of support groups at the village, the women have been selling the produce at a premium price. They have fruit trees that not only gives them additional income, but our children get fresh local fruit to eat. Those trees attract birds and that's why they are wanting to be trained on birds of Uttarakhand. Not just that, they have also worked on their local artforms and have developed entrepreneurial skills.

RADHA:
Maybe it is time to change. Why don't we also try this in our village sisters?



MEENA:
Yes we should. We can start by implementing organic farming and move towards conducting vocational training - value added traditional foods like papad, pickles, jams, woodwork, decorative items, and herbal products like soaps. This way we will learn together through mutual support. This will enhance our decision making power and foster our leadership skills. And the raw material, including from trees like mango, shisham, walnuts, bamboo and fruits - all grown on our lands

RADHA:
...that way they don't have to move to cities for seeking short-term labor work. We can also seek assistance for getting organized into a Farmer Producer Organisation for better inputs and markets



RADHA:
This way we can also motivate the men in our households to join us in these practices -



SAKHI:
I feel empowered by what we're doing. Sustainable farming connects us to our roots and gives us a voice in shaping a sustainable future. We should bring back the crops which dada and nana used to grow and dadi and nani used to turn into such delicious meals



PREMA:
Didi, are you home?



JAYA:
How come
you've come here?
Is there not much to do
on the fields today?



**MOVING
FORWARD
TOGETHER**

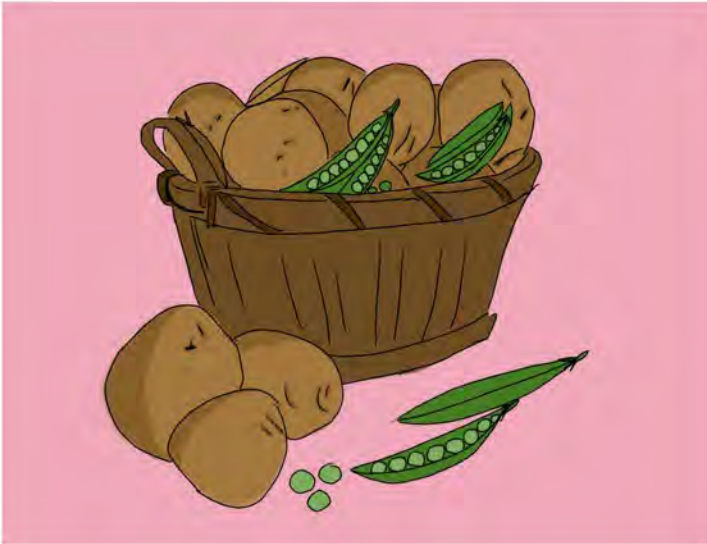


PREMA:
I am really looking forward to restoring the health of my land by taking up organic farming practices. But I am unsure how and where to start. I am also worried about the sale and marketing of my produce. How will I recover the cost for organic farming? I heard that organic farming produces less yield and I am forced to sell my produce at Haldwani Mandi at the same rate as everyone else - even those who may be using chemicals

JAYA:
Oh Prema, my husband and I had the same concerns. However, we paid a visit to the KVK to understand how to start organic farming and the requirements for certification of organic produce. They told us that yields may drop for a couple of years but thereafter the yield is restored. It can look disadvantageous, but trust us, we are doing much better now since we are a part of a Farmer Producer Organisation supported by the government. And so is our land! We also get our organic produce certified so that it reaches good markets. Come join us. You can also check the details of your nearest KVK at www.gbpuat.ac.in



PREMA:
What is that didi?



JAYA:

See, last year all members of the FPO grew off-season peas and potatoes. Because we were all connected to the FPO we were able to sell our produce at a better market price.

PREMA:

Did you all travel together to the mandi?

JAYA:

Not at all. As part of the FPO, we farmers have storage infrastructure, good quality packaging material and also handles the transportation for us.

PREMA:

But didi, whats the difference? Don't you go through a middleman? That is very unreliable.

JAYA:

No Prema.

This is a much more modern approach. As an FPO we have learnt to carry out end to end services, starting with cultivation, inputs, a bit of primary processing like grading sorting so that we get a good price in the market. Some buyers even pick up the produce from my farm gate. The FPO is run by us fellow farmers collectively!

PREMA:

Really? I didn't know about it!

JAYA:

I will take you to the office tomorrow morning and you can join after completing a few formalities. You can also check for information at www.gbpuat.ac.in



PREMA:

I am excited about this didi. Thank you.

