



**NOV.
2024**

I V D TRUST

INTEGRATED VILLAGE DEVELOPMENT

Newsletter No.34

. . . working in India to relieve rural poverty.

We produce our newsletter to let all our supporters know what work we have been doing over the past year and how it is progressing. We also sometimes talk about the background, the context, to try and create a fuller picture of the communities with which we work. In many ways the lives of the people in rural Odisha are so very different from ours that it is hard to imagine what reality must be like for them. Over time, with greater access to mobile phones and television, those differences have begun to shrink, but they are still there, and I hope that we are able to open a window for you into another world, their world.

While I visit the projects I am, of course, checking up on our work, but I also spend a great deal of time listening to people, trying to understand what are their most serious concerns, what they want to change, and thinking about how some of this might be realised. Like human beings everywhere, the people I meet tell me their stories, and like people everywhere, I love a story. Sometimes it might break my heart; at other times fill me with joy. They are always illuminating. The stories I hear lead directly to the work that we do. This newsletter brings you some of the stories of our projects, of the change that we are able to make possible, the ways in which we are able to help people deal with the problems that life throws at them.

During the past year, the state of the world has tested us in many ways. Those of us who do not turn away are only too aware of the terrible suffering which is endured by many innocent people. In the face of this it is all too easy to feel utterly helpless. But in fact there are always things that we can do, in all sorts of ways – writing letters, speaking out for what we believe to be right, shaping our lives so that they reflect the values that we most care about, and reaching out to others. And doing these things can help us, help us realise that we have agency, that we can help bring positive change. Like the people on our projects, our actions on their own might not solve the world's problems, but it makes a significant difference, and it also acts as a model for how humans should behave in this troubled world.

We are only able to write briefly about our projects in this newsletter. If you would like to know more about any of our work, please do not hesitate to get in touch at: helenanightingale@hotmail.com In the meantime, we are really grateful to you all, and . . .

THANK YOU FOR YOUR SUPPORT

DEALING with HEATWAVE and CYCLONE

Those of us who live in Britain, especially on the western edge, are familiar with weather as a constantly changing and unpredictable companion, but on continental masses a weather system sometimes becomes deeply entrenched with temperatures building higher and higher. These systems can last for days and even weeks. India was in the news earlier this year, beset by a heatwave which seemed to go on and on, taking lives. By May reports were coming through that the temperatures in Odisha were reaching the high 40s, nudging 50°C. It went on for days and endless days. Odisha was badly hit, but not as badly as Delhi and Rajasthan where it was even hotter; 733 deaths in India, 110 deaths in Odisha (HeatWatch report). These figures seem high, but they are in fact a great deal lower than in years gone by. For example, in 2015, there were over 2,000 lives lost in an Indian heatwave, and in 1998 over 950 died of heatstroke in one week in Odisha alone. One of those deaths was of Baikuntha Biswal, a journalist who had gone out to report on the heatwave situation. Ironically, but sadly, he himself became the story when he was overcome by the heat and failed to recover. His story resonated and helped change government policy.

These high death tolls and increasing public anger led to state government action to reduce the impact. In 2022 Odisha adopted a **Heat Action Plan** developed by the Odisha State Disaster Management Authority. This provides procedures for different departments and districts. Once the temperature reaches a certain point steps are taken such as rescheduling work hours for daily wage labourers, providing drinking water and first aid facilities at temporary work sheds, changing school times and so on. These measures are widely promoted, and have helped, but good plans can be thwarted. This year the heatwave coincided with elections, and among those who died were election officials who had no choice but to continue working in the sun. Shade had been provided for traffic police, but no one had thought about those queueing, determined to vote, or those supervising. We hope lessons will continue to be learnt.

Eventually the heat broke. Much to everyone's relief the monsoon arrived, late, but not as heavy as had been feared. Temperatures fell and life could resume. It is tempting to attribute such events to global warming, and their extent may well be connected, but there is a definite connection to the El Niño/La Niña cycles, so this heatwave will not be the last.

While I was writing the above, news came through that a major cyclone was building in the Bay of Bengal, heading directly towards the coast of Odisha, forecast to make landfall at our project area. Our hearts were in our mouths. This stretch of the coast has suffered major damage regularly over the years. Stories of past cyclones provided a starting point for our mangrove regeneration project, and many of those still alive have terrible memories of these events. As the cyclone approached the coast, everyone prepared as best they could, taking shelter and bracing themselves for the worst. This time, though, to everyone's relief, the cyclone lost much of its energy as it approached and the damage was mostly minimal. The one village which was particularly affected was Bagapatia. Not one of our project villages, but nearby, this is a relatively new settlement set up to house villagers from Satabhaya who had been displaced as, over the years, their village had been washed away by the sea. Bagapatia was badly flooded, but no lives were lost. And they had no land; the government had not been generous enough for that, so they did not have to worry about salination of the soil. Small blessing, as they face yet another struggle.

Recent funders include: *David Bennett, Mike Deeks, The Just Trust, Alex Hopper, Richard Hopper, The Howarth family, Douglas MacIldoon, The Merali family, Religious Society of Friends (Cornwall), Ann Scott, Mary Stephens, Anthony Stevens, and many others.*
Thank you to all our donors

FARMING in Coastal Odisha

What is a typical coastal Odiya farm? The average farm is around two and a half acres, though many are smaller. The land is flat. There is no natural irrigation, and the quality of the soil is not brilliant. It is alluvial and tends to be rather stiff sandy clay. Traditionally cattle would be let out on the land after harvest and this would help provide a small amount of fertiliser. The soil tends to compact, and become so hard that it is difficult to plough. It is not naturally very fertile, and fertility is diminishing leading to lower yields.

These days, the only crop is padi, grown to produce rice, just one crop each year, all that is possible without irrigation. The seed is sown in small beds in the wet season, then transplanted into the fields while they are still wet, and harvested in November. Methods of planting have changed in recent years, but in this area there is little flexibility because of the lack of irrigation. Thirty-five years ago, pulses were grown as well, and the varieties of rice were local. Twenty-five years ago it was beginning to change. Farmers still grew some pulses, but the local varieties of rice had given way to new higher yielding varieties. Fifteen years ago pulses were no longer grown. Now it is nothing but padi.

Speaking to farmers, one hears repeated stories of reducing fertility. They talk about how, once upon a time, new varieties were introduced, and pesticides and fertilisers became available. Yields went up and there was a golden time. With increased harvests, they saw the end of hunger. But since then, the cost of seed, pesticide, fungicide, fertiliser and labour have all increased. The new varieties of rice which are higher yielding, but are less flood tolerant, and need a high input to protect them. It has reached the point where growing padi now usually makes a loss, and fewer people keep cattle. Farmers are looking to increase their incomes in other ways. Some have been tempted by prawn farming. Others have migrated. Many rely on children who have migrated and send back money to keep their families going. Others continue to farm, reluctant to abandon their land, but have set up businesses doing other things: running a grocery shop, or a catering business, for example.

When asked who will take over the farm in due course, most of them shake their heads sadly. The reality is that life on the farm is simply unacceptable to most of the younger generation. Who would want to spend their lives doing hard physical work, day in, day out, for no profit, taking risks that depend entirely on the weather and chance? And who would want that for their children? For people who have lived in extended families for generation upon generation, it is troubling to see the dispersal of those who mean most to them. Coming to terms with the separation is difficult, but it is especially hard to face the fact that there is no future for their farm. It was heart-breaking to listen to farmers speaking with great dignity about the difficulties that they face in making a living from their land, knowing that they might well be the last generation to continue producing food for the country.

As one drives around the area, each year there is more land left uncultivated. It is not an isolated problem, just one family here and another one there. It is commonplace, and each year more join the trend. In some areas there is a desolate and abandoned feel, and one cannot but wonder what the future holds for the area as a whole. This is a story that is not unique to rural India.

MIGRATION

During conversation in villages, whatever the subject, the talk sooner or later turns to migration. It is a part of the fabric of everyone's life. Migration is not a new phenomenon. *Homo sapiens* might better be described as *Homo ambulans* or even *Homo migrans*. Our histories are filled with accounts of peoples and groups of people moving from here to there, or there to here, and so it continues.

The reasons are primarily to do with economics and opportunity. As education in rural Odisha improves, new skills enable young people to move for work - a daughter who works in IT in Delhi, or a son who is an accountant in Chennai. But while it is possible for a few people from Rajnagar to enter these worlds, it is beyond the dreams of most village people. For the majority, migration is an economic necessity. Most of the work in Rajnagar is agricultural. It never made for affluence, and as the fertility of the land diminishes, it is increasingly precarious. The problems facing farmers are described on the previous page. There is little other work available: the Forest Dept., maybe, or, if one is lucky, becoming a teacher. And so, the children go elsewhere to work.

Those who go have usually had the least education, just up to the tenth grade (93%). The work available is unskilled heavy labouring. Those who have some kind of skill or qualification might find a job in Odisha, but for the less fortunate two-thirds the favoured destination these days is Kerala. The jobs there will be in construction, transport (as drivers) or in factories (often plywood factories). Or if they go to Gujarat, there is the possibility of work in a spinning mill. The jobs available will have no entry barrier, and expect no skill, simply a fit and willing body. The wages are low, but the income of migrant households is twice that of non-migrant households, and the money sent home makes an important contribution to food bills, healthcare and education for the family.

The migrants face many problems. Without ID cards they have little access to government benefits, and are unable to buy subsidised rations, for example. Much of the work is un-unionised, so there is little job security or protection. They will be employed in the lowest status jobs, with low wages, often highly exploited. There will be no training provided, any learning is done on the job, and there is little prospect of advancement. Many migrant workers live in dreadful conditions, sometimes in dorms provided by their employer, or camping out in slums sharing space with a large number of other workers, often with no sanitation, cooking facilities or access to any normal amenities. Sometimes pay does not materialise. Accidents are frequent because there are insufficient safeguards, and compensation is rare.

However, migration does increase income and means their homes and families in Odisha can be supported. Home is where most of them wish to be, if only it were possible. The increased income makes it possible to buy other things too, a television, maybe, and a mobile phone.

Migration also opens doors to a wider world. When people migrate they are potentially exposed to "otherness", to difference, to experiences and attitudes which they would never have encountered at home. They bring these worldly experiences back with them, and their world at home gradually changes. In the end, many of them might have to face the fact that there is no economic future for them back in coastal Odisha and they will make their homes elsewhere, where they are able to find profitable work, but the truth is that for those who live in coastal Odisha, and who farm the land, this is where their hearts lie and where they wish to make their lives.

TFR – TOPSOIL FERTILITY REGENERATION

Given the problems that we have outlined on the previous two pages, it was clear that we needed to think about how we might help local farmers. A UN report stated that without nurturing the soil it is only possible to gain 60-80 harvests; time had run out. Anyone who has a kitchen garden or allotment knows only too well the importance of rotating your crops and of maintaining the fertility of the soil. A couple of generations ago this was clearly understood, but in the push to secure food production for a hungry nation, India espoused an agricultural policy which promoted mono-cropping and the extensive use of chemical fertilisers. How to get back to the wisdom of the past? It is easy enough on a small scale, as we have demonstrated in our Kitchen Gardens Project, but it is hard to figure out how we might do this on a large scale when we have extensive open fields.

Over the past couple of years we have discussed these matters with local farmers and given it a great deal of thought. We drew up a plan and project proposal aimed at restoring the fertility of the soil, and tried to find funding. Unsuccessfully. And then, by chance, or perhaps as a result of our long discussions with the Agricultural Dept., they decided to run a pilot project to put in place many of the measures which we had been planning! It was an opportunity not to be missed. Our partners immediately applied to have the Dangamal/Subarnapur area accepted as the locus of the pilot, and probably because of the excellent relationship that we have with them, it was agreed. IVDT was very keen that this opportunity should be grasped with both hands and enthusiasm, and we agreed to fund a support programme which would run in parallel with the pilot project. The aim of this is to do everything we could to ensure that the pilot is a success and that the maximum number of farmers gain the maximum possible benefit. It seemed that this was an intelligent way to combine our skills of community mobilisation and advocacy with the resources and expertise of a government department. We were determined this project should not go the way of many other well-meant government programmes, and fizzle out leaving everyone feeling cynical.

The pilot has recruited 180 farmers (both men and women) to participate in a programme which will undertake crop rotation, with the cultivation of black, green and horse gram (all legumes), production of green manure (dhandicha and nalita), cultivation of green vegetables, multi-cropping, and large-scale compost-making. The Agricultural Dept. provides the expertise, seed and grants to participating farmers. A digital crop survey of 500 plots has been carried out enabling farmers to



An officer from the Agricultural Dept. gives advice on growing moong beans

get support and subsidies. The farmers have been trained to collect samples for soil testing so that levels of fertility can be carefully monitored. Fifty farmers have been trained in improved and more sustainable methods of growing padi, and have planted out the young seedlings. A further hundred will follow suit in coming years. Banks around fields have been raised to enable rainwater to seep into the soil naturally and to keep out salt water. The digging of six ponds has been funded, and they have been stocked with “fingerlings” for the production of fish. Some of the farmers are also receiving training in integrating cow and goat rearing and their organic manure into the new system and improving topsoil fertility.



Participating farmers are delighted with the first mung bean harvest

Originally, the proposal was for a small-scale pilot, with only five farmers, but because of the enthusiasm and commitment of our partner, the work is being carried out on a much larger scale. The pilot is now ten months into its first year. Yields have been good, and so far all those who have been involved are delighted with the progress. We hope that this will help secure a future for local farmers.

(Please note: the photographs show mainly male participants, but I would like to reassure readers that there are many women farmers who are involved in the pilot.)

KITCHEN GARDENS

We have been promoting kitchen gardens and home composting for several years now, and it has made a tremendous difference to the lives of many families. The Topsoil Fertility Regeneration Programme includes kitchen gardens as an integrated part of the project, and 370 women have been recruited. They have received training and support to set up their gardens and to make their own compost, and plant-based fertilisers and pest control. The progress of these gardens is carefully monitored. Four seed banks have been established so that local seeds especially suited to the area can be preserved and shared. Several women have been trained in duck-rearing (or “dockery” as it is charmingly called locally) and mushroom cultivation in order to increase family incomes.

We have developed considerable expertise in fruit-tree grafting through MANGRO, and have enabled new grafters to successfully raise 900 lemon and mango saplings. We have also identified fifty families who are eligible for subsidies to establish orchards as part of income-generation.

There is no magic bullet, but we hope that by investing in these farming families, we can help to secure their future in their home villages.



Kitchen gardens are a vital part of an integrated agricultural system

MANGRO NEWS

It has always been important for us to work closely with the Forest Dept. In the early days they helped us by providing machinery for digging channels for our mangrove nursery, and allowed us to collect seeds from the mangrove forest. As we rapidly gained experience and expertise, and had such a high success rate with our plantations, we were in a stronger position to campaign for them to carry out plantation themselves. We were able to offer advice, and supported their plantation work by involving local communities. Gradually they began to ask us to work on their plantations, filling in where trees had been damaged or lost, or to work on small areas which were awkward for their equipment. It has been one of the great achievements of the project to see the changes within the Forest Dept. itself, which is now deeply committed to restoring the mangrove along the coast and estuaries. The latest step is where we have worked alongside them, and they have agreed to plant on a matching basis – 10,000 MANGRO trees, and 10,000 Forest Dept. trees.

Is it time to step back and allow the Forest Dept. to carry out the work, for which it is apparently so well equipped? We do give this considerable thought, because, obviously, if the work can be done by someone else, then it saves us a great deal of time and energy, and our donor's money which could perhaps be better used elsewhere. The conclusion that we have come to is that we still have a very useful role. For example, we have an important lobbying role, arguing the case for the restoration of mangrove forest, and our case is stronger if we can speak with the authority of experience and are seen to be practising what we preach. We have an excellent record with survival of our plantations, which is largely due to the work being carried out by and "belonging" to the community, so we act as a model for good practice. We are able to work in areas which are difficult for the Forest Dept., small and hard-to-access sites, which are nevertheless important ecologically. And we are able to work on private land; for example, recently the Koelipur sarpanch (village chairperson) has donated two acres of land for mangrove plantation. It is outside the National Park, and so it has to be a village project; there is no one else to carry it out but MANGRO, and it was his wish that we would take it on anyway.

So we still have an important role to play, and it is a great relief that we are no longer doing this single-handed.



Rama celebrates the extent of one of our plantation areas; all this, and more!



and demonstrates the strength of the mangrove's stilt roots.

This year we have continued to plant extensively. The plantation of 175,000 trees has been carried out on demolished farm pond land, degraded forest land, river and creek sites, as well as gap filling. The Forest Dept. has agreed a policy of granting Rs. 10,000 (₹100) per acre to any farmer who hands over for mangrove plantation land which is flooded at high tide. And, as mentioned above, we work closely with the Forest Dept., to ensure that as much effective plantation is carried out as possible.

Meanwhile, environmental education work continues, with school Eco-clubs visiting the MANGRO Centre, nurseries and plantations. We are restoring the Hental Kutira, a small hut which was originally set up for pre-school children at our nature reserve, but which fell into disuse when the government took on that role. This is going to be repurposed as a small observation and learning centre, so that visitors to the nature reserve can get maximum benefit from the experience. “The Hental”,

our magazine for Eco-clubs, continues to be published and enjoyed, well beyond our project area, and the children continue to keep nature diaries. Having refreshed some of our learning materials on my last visit, I get reports that children are really enjoying playing games and carrying out other activities as they learn about the birds of Odisha, mangroves and other aspects of wildlife and the environment.

Our work extends not just to planting mangrove and raising awareness about the environment. Other concerns are brought to us. We always try and help by giving advice or redirecting people, but sometimes we are in a position to take up an issue. For example, some communities have suffered from the increasing numbers of wild boar which shelter in the expanding forest. We have been able to negotiate for the Forest Dept. to provide fencing where appropriate, and to compensate farmers for damage caused to their crops. We have lobbied for provision to be made for fishermen who are affected by the seasonal fishing ban imposed to protect Olive Ridley Sea Turtles which migrate to the area to lay their eggs. Now 120 fishermen and their families have been provided with training and support in a range of skills: mushroom and vegetable cultivation, tailoring, dockery(!)/poultry farming and beekeeping.

MANGRO continues to carry out an extensive and vigorous programme in increasing the environmental and economic resilience of an area which is prone to disasters, and we feel that this work, a step at a time, over the years we have worked there, is making a significant difference.



Hemanta Rout, one of our long-term activists, and Rama explore new sites ripe for mangrove plantation

Thank you to everyone who has helped.

PRAWN PONDS

I've already mentioned illegal prawn ponds in this letter, and many times over the years - I do hope that you're not bored with reading about them! It has been such a big issue for so long, maybe twenty-five years since we first realised quite what an impact they have on the environment. Not only the illegal prawn ponds; there was the huge defunct World Bank-funded prawn farm project too. At first we wrote about the problems they caused, then about the struggle that was being undertaken to have them put out of action. At last we had success, and steps were taken to destroy them. And then we had to work hard to ensure the land was restored to forest use. After a slow start, the work has suddenly come to fruition. In our last newsletter I showed pictures of some of the old pond areas planted with mangrove. That work has continued and the following is an update on the situation:

*In **Rajnagar Block**, prawn ponds have been destroyed in the following: Rangani (100 ponds destroyed), from Talchua to Durgaprashad and Dangamal (280 ponds (188.09 hectares) mangrove nursery work initiated and plantation to be done this year), Patasala River (50 prawn ponds destroyed and mangrove plantation partially done), Praharajpur, Sundaripal, Olasahi, and Govardhanpur area- (10 prawn ponds destroyed, Chale Chalo & Forest Dept did the plantation), Gupti, Okilpal to Bagapatia (150 prawn ponds destroyed). Plantation has been carried out by MANGRO and by the Forest Dept., sometimes working together.*

Around 130 prawn ponds have litigations and cases are pending in the Honourable Odisha High Court.

*So far as **Mahakalpada Block** is concerned, around 1400 prawn ponds have been destroyed. The details are as follows: Jagatjor - 40, Jambu - 150, Kharanashi - 200, Ramnagar - 100, Batighar - 100, Sanatubi 1 - 200 (60 ha), Sanatubi 2 - 100 (30 ha), Sanatubi 3 - 110 (35 ha), Badatubi - 200, Hettamundia - 100 (30 ha), Jogidhakud- 90 (25 ha). Mangrove plantation has been carried out, mainly by the Forest Dept., in all of these apart from Jagatjor and Jambu.*

After the destruction of all the prawn ponds adjacent to the Patasala Riverside, farmers started prawn culture by constructing ponds on their own land (the other side of the road from Ishwarpur to Bhitarkanika). As per the ESZ policy (Environmentally Sensitive Zone), no such activities are allowed within 500 meters of the coast. The Forest Dept. has not taken any action on the new ponds, the reasons best known to them. However, we will discuss the matter with forest officials to know the reasons for the increase in number of prawn ponds on private land between Bhitarkanika National Park and Patasala River.

About Falcon (the defunct World Bank-funded prawn farm project), some of this is subject to pending cases in the Honorable Odisha High Court, and the rest is in dispute. More will be done in coming years when this is resolved. These positive changes are happening due to a long campaign for the demolition of the prawn ponds and undertaking massive mangrove plantation in Bhitarkanika and vulnerable periphery areas.

We will continue with this work; it has been one of the most important contributions to expanding mangrove plantation, restoring the area to what it once was.

FOOTNOTE on CARBON FOOTPRINT

There are many reasons for planting mangrove, but one of the reasons so many of our supporters are interesting in this aspect of our work is the remarkable capacity of mangrove to sequester CO₂, thus helping in the fight against global warming. Mangrove has many benefits, this amongst them, and we enclose a sheet which outlines its capacity to store carbon, amongst the other benefits.

SUMMARY of IVDTrust accounts for 01.04.23 to 31.03.24

Balance on 01.04.2023

Nat. West Bank	12,368.21
COIF	<u>239.66</u>
TOTAL	<u>12,607.87</u>

Income for the year

Covenants & donations	20,525.02
The Just Trust	2,000.00
HMRC Gift Aid Refund (for 2 years)	5,388.76
COIF Interest	<u>11.65</u>
TOTAL	<u>27,925.43</u>

Expenditure for the year

CHALE CHALO, projects	14,234.00 *
CC Core Costs	9,624.00 *
UK admin., memberships, etc.	0
Fundraising costs	<u>0</u>
TOTAL	<u>23,858.00</u>

Balance on 31.03.2024

Nat. West Bank	16,423.99
CAF	<u>251.31</u>
TOTAL	<u>16,675.30</u>

* *These payments to our Indian partners include UK bank charges*

The accounts have been independently examined and we are very grateful to Mike Deeks for carrying that out. They have been submitted to the Charity Commission.

GIVING to IVDT

Without your help it would be impossible for us to continue with our work, so all donations are always very welcome.

GIFT AID - If you are a taxpayer, then you can make it possible for us to reclaim the tax on your gift – it gives us an extra 25% on top of your donation, and that can make a tremendous difference.

REGULAR GIVING by Direct Debit – Regular giving makes it much easier for us to plan our work. If you feel that you could manage to give in this way, we would be especially grateful.

DONATIONS can be made online using Paypal through our website: **www.ivdtrust.org**

or by post to:

47 Brome Place, OXFORD OX3 9LR or
7a Rosewin Row, TRURO TR1 1HG
with cheques made out to 'IVDT'.

Gift Aid and Direct Debit forms are included with the newsletter. Thank you.

We will continue to send out newsletters by post to those on our mailing list, but we are trying to reduce our costs, so if any of you would be happy to receive the newsletter by email, please do let us know, and we can make sure that that happens in future.

Contact us at:

helenanightingale@hotmail.com

THANK YOU FOR YOUR SUPPORT

We hope you enjoy reading about our work and all that our projects are achieving with your generosity. We feel very proud of what we help happen, bringing positive change to the lives of so many people, and it would not be possible without your help. The need for support continues – there are always more ways to spend money than raise it! Please help if you can. Your donations make a tremendous difference to the lives of people and communities. Details for making a donation are given on the last page. Thank you to everyone.



*Pictured above, some of the farmers participating in our Topsoil Fertility Programme
And greetings from everyone in Odisha who benefits from your generosity*

IVD Trust, Charity No. 1013316. Registered Address: 47 Brome Place, Oxford OX3 9LR

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THE IMPACT OF PLANTING MANGROVE, including its CARBON FOOTPRINT

The planting of mangrove brings many advantages, to local communities and to the world as a whole. This paper attempts to summarise the key points.

1. SEQUESTERING CARBON

There is no definitive figure for the capacity of mangrove to sequester carbon, because mangrove varies widely in its nature, quality and ability to store carbon. That must be borne in mind when considering the following figures which have been taken from a wide range of sources, including the UNEP, Smithsonian Institute and Open University.

Mangrove can sequester between four and ten times as much carbon as rainforest. It is one of the most effective environments for storing carbon, the reason being that the carbon is stored not just in the body of the trees themselves (trunks, branches, leaves, roots, etc.), but also in the sediments made of dead roots and decaying vegetable matter which is trapped in the anaerobic conditions of the mangrove's complex root systems, sediments which can be up to 10m deep in mature forests.

The figures for the annual sequestration of carbon (C, not CO₂) per hectare range from 492.8 mt (Greenbiz) to 3,700 mt (Earth.org), but most of the figures given are in the region of 1,000 mt of carbon p.a. There are two main factors affecting the capacity of mangrove forest to store carbon. One is the age of the trees; the storage capacity increases up to the age of about fifteen years, so the maximum capacity is not achieved on initial planting. The second is the density of plantation. We plant at 10,000 per hectare, but several sites talk about much lower figures – 1,000 (MoreTrees and Planet Indonesia), 3,000 (Conservation International), but the general consensus is in line with our own practice, 10,000 per hectare.

So the figures that we go with are: planting at **10,000 trees per hectare** and the sequestering of carbon at **1,000 mt per hectare** (mt=metric tonne). These figures are reasonable and also easy to remember and work with.

One important point to note is that, while mangrove is one of the most successful ways of sequestering carbon, when it is felled, that carbon is released into the atmosphere and has a disproportionate negative impact. So it is doubly important that mangrove should **not** be felled.

2. PROTECTION AGAINST WEATHER

With increasing global temperatures, extreme weather is becoming more common. Odisha (our Project area) is already a disaster-prone state, and the intensity of cyclones is likely to increase. Mangrove cannot prevent flooding, but it does protect against the most serious damage which is caused by water in movement. The complex root and trunk systems reduce both the height of a tidal surge by up to 50% and its force by up to 90%. We have found that the combination of mangrove plantation backed by an embankment is very effective in saving lives and damage to land and property.

3. REDUCTION OF COASTAL AND ESTUARINE EROSION

Just as mangrove breaks the force of a tidal surge, so it protects the coast or estuary edge against erosion. The complex root systems trap sediment, and prevent it from being washed away. When mangrove is felled, for whatever reason, the shoreline immediately becomes vulnerable which has serious implications for communities and habitats.

4. IMPROVING FOOD SECURITY

The mangrove acts as a nursery for young fish, providing protection and a rich source of food. Studies have shown how the fish numbers increase when mangrove is planted, and our own experience bears this out. In a world which struggles hard to feed itself sustainably, this is an invaluable resource.

5. DIVERSITY

Mangroves are an incredibly rich eco-system supporting a very diverse range of plant and animal life. Many of the creatures which find refuge in mangrove are threatened with extinction or on the endangered list.

THREATS

Globally, mangrove is under constant threat, with perhaps 5% being lost every year. And yet it is one of the most valuable means of storing carbon. The main causes of loss are development, prawn ponds, and pollution. In our project areas we have managed to reduce the damage caused by people collecting fuel wood, but prawn ponds have been an ongoing issue. Following a long and intensive campaign, with the illegal pond farmers being taken to court, the Forest Dept. in our project area has destroyed many of the ponds and is replanting them with mangrove.

COST OF REPLANTING MANGROVE

As with other figures, the cost of replanting mangrove varies widely. This is probably because it depends entirely on what is included in the cost. Does it cover merely the cost of raising the saplings in a nursery, planting them out and caring for them? Do the people who carry out the work get paid? What about the overall costs of running a project, the planning, discussion with community, etc., etc.? The figure that is sometimes given when arguing for the economic importance of mangrove is \$23,000-45,000 per hectare, which would work out at \$23-45 per tree. This figure surely includes all the overheads.

It is very difficult for us to work out the actual costs of our direct planting. It probably works out at about £0.14 per tree. But that does not include all the education work that is carried out, or the kitchen garden projects, or the work we do on sustainable farming, all of which contribute to the success of the project. Nor does it take into account the fact that the project has influenced policy on local planting, or that through campaign and community-partnership tree-planting has taken place on a much larger scale.

A simple example is the campaign which we initiated and supported to ban illegal prawn ponds which were widespread with our project area. The issue was taken to the High Court, and the Forest Dept has since destroyed about 640 hectares of ponds which are now being planted with mangrove. Though some of our volunteers might be involved as community members in this planting, the number of trees planting would not be attributed to us, and yet, if the campaign had not been run, none of those trees would have been planted. It is important to plant trees, but it is also very important to encourage and even demand that others plant trees too. It is all part of the same enterprise.

*The **MANGRO PROJECT** is a community-based mangrove regeneration project in Odisha, India. It is funded by Integrated Village Development Trust, and managed by CHALE CHALO. For further information see: ivdtrust.org or contact Helena Nightingale at helenanightingale@hotmail.com*

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If you wish to be a regular donor, please use the **Monthly Standing Order Form** below. Regular donations help us to plan ahead for our work and fundraising, but all gifts are welcome. If you want us to know about your gift, please let us know, then we can thank you properly, and for those of you who are tax payers, there is a **Gift Aid Form** as well. We also need your consent to keep your **details**, and there is a form for that below as well. Very many thanks to you all.

.....
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Please pay from my account each month on (date) the sum of £ to the IVD Trust (Charity No. 1013316), Account No. 87213508, Nat. West Bank, 32 Cornmarket Street, OXFORD OX1 3ES (Sort Code 54-21-23)

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Please return to: Integrated Village Development Trust, 7a Rosewin Row, Truro, Cornwall TR1 1HG

Mr/Mrs/Miss/Ms (Surname & initials)

Address:

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I, (name), of (address)

..... Email

do give my consent that IVDT may keep my contact details as given above, and may contact me with news and information about their work.

Signed Date