

SOMB-THAPANA CATCHMENT PLAN

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Thames Rivers Trust



PEACE Institute Charitable Trust

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SOMB-THAPANA CATCHMENT PLAN

1. INTRODUCTION:

River Yamuna is a 1376 km long river of north India. Originating from a glacier pond called as the Saptrishi Kund located at a height of 4400 m in the Bandarpunch mastiff, the river is one of the major Himalayan Rivers and constitutes the largest tributary to the river Ganga. Known as the river of Lord Krishna, it is along with river Ganga two of the most holy rivers of India.

Unfortunately the river Yamuna now has the reputation of being one of the most threatened river systems in the country, due on one hand to the over abstraction of its waters at barrages and on the other an unceasing pollution of its waters from sewage and industrial waste entering it from several cities like Yamunanagar, Panipat, Delhi NCR (National Capital Region), Mathura, Agra and Etawah. The fact that the river Yamuna basin extends over seven states of the union namely HP (Himachal Pradesh), UKH (Uttarakhand), Haryana, UP (Uttar Pradesh), NCT of Delhi, Rajasthan and MP (Madhya Pradesh) and that it forms inter-state border over large distances adds to the complexity and problems that the river is faced with.

Lack of any worthwhile perennial tributary feeding it along its most threatened stretch of around 600 km from Hathnikund (Haryana) till Etawah (UP) where it revives once river Chambal has met it, does little to help matters.

Therefore, when in 2011 we heard from the members of the local Nadi Mitra Mandali, NMM during our field surveys as part of the Thames-Ganga twinning program for the development of river restoration techniques, about a perennial stream called 'Thapana' which meets the river Somb, a seasonal tributary of river Yamuna in the district of Yamunanagar (north-east Haryana), our curiosity to learn more about it was aroused. Then few photographs taken on 8 Aug 2012 at a largish pond in the Thapana system suggested to the possible presence of golden Mahseer, a popular sport fish, which added value to the Thapana's importance, since Mahseer has reportedly become quite scarce in the entire river Yamuna system.

Further visits to the area convinced us that river Thapana, no matter its small basin and limited length was a unique although threatened system and deserved not just greater research but also concerted conservation action. Preparation of a Catchment Restoration Plan for the Somb-Thapana system was thus taken up as a possible first step in that direction.

2. METHODOLOGY:

It was the Nadi Mitra Mandali, NMM (Yamuna Sewa Samiti) at the Kanalsi GRID that on 29 Sep 2012 took the first step in people's participation in Thapana conservation through a public event held at the bank of river Thapana, where the latter was declared as a *Lok Samrakshit Nadi* (Community Conserved River).



The actual planning for improved understanding of the Somb – Thapana river system started with Mr Nishikant Gupta, a doctoral student at the King's College, London (UK) expressing keenness beginning December 2012 to investigate the Somb-Thapana system with the following objectives:

- a) Understand habitat characteristics
- b) Fish sampling
- c) Document other species and human impacts

The TRT agreed to support the said field visit and study by Mr Gupta. A small local team, consisting of a technical assistant, few members of Yamuna Sewa Samiti (NMM) and a PEACE official was to assist Mr Gupta in the logistics of the survey work as well as in documentation of the socio-economics of the villages falling within the catchment area.

The said survey was carried out in the first half (2nd -10th Dec) of December 2012. **(A report from the survey is enclosed as Annexure 1).**

Further surveys were carried out in the months of February, March and April, 2013 for greater assessment of the conservation status of the Somb -Thapana system. Survey included GPS mapping of the area and the assessments of physico-chemical parameters like pH, ambient temperature and water temperature at various sampling sites.



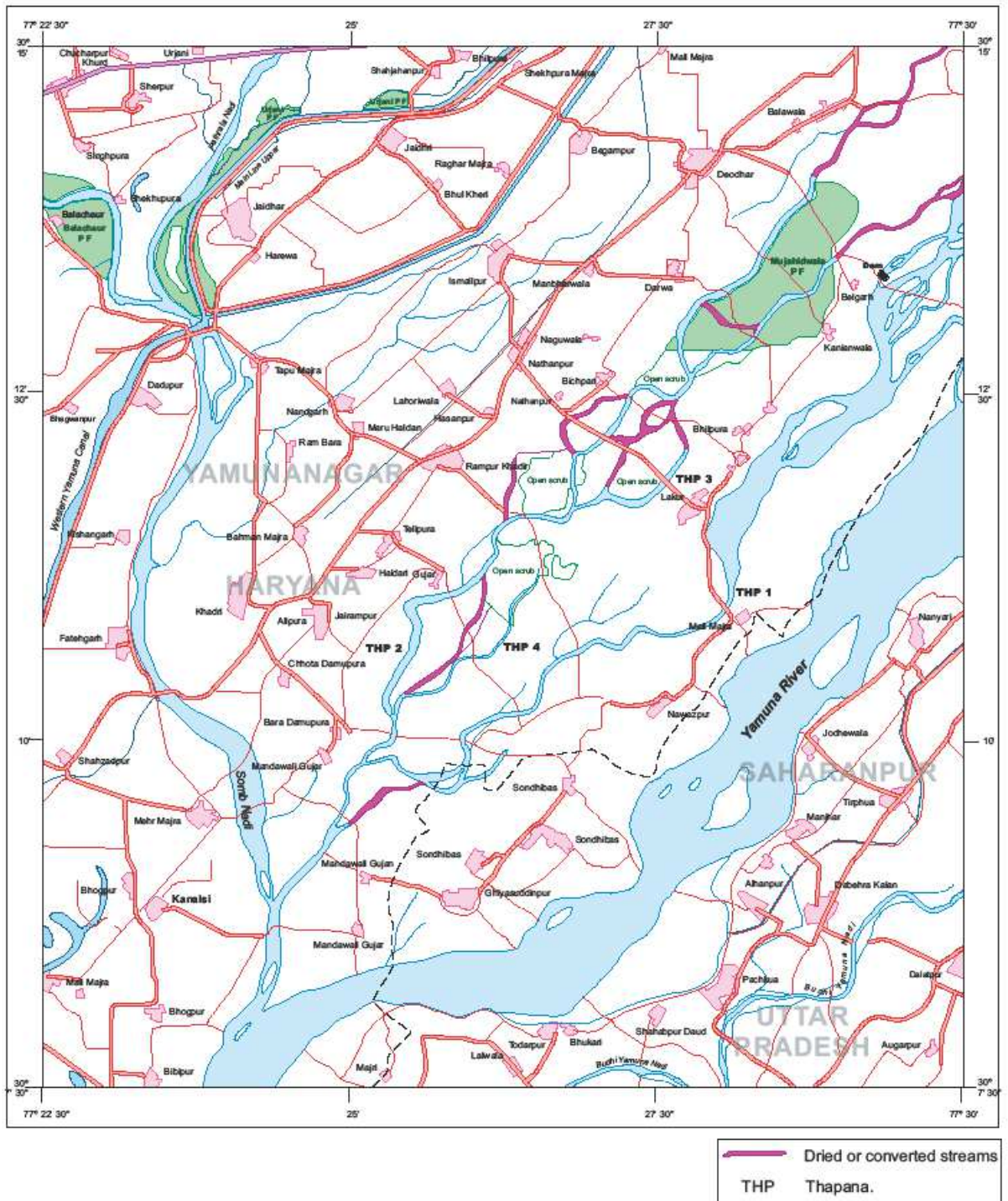
GPS survey underway on Thapana 2

Later on 14 April 2013 a stakeholders' meet was held at a temple premises close to the village *Lakad* within the Thapana catchment, where the team's understanding about the ground situation as regards Somb and Thapana was shared with the participants. (**Report of the stakeholder's meet is at Annexure 2**).



Stakeholder's meet held in a temple at Lakad village

3. DESCRIPTION OF THE AREA:



Map 1: Somb-Thapana System

Environmental

a) Location

The river Somb (part) – Thapana catchment area spread over approx. 30 sq km lies at 30° 13' 52" N Lat and 77° 28' 04" E Long.

Eastern Boundary: River Yamuna

Western Boundary: River Somb, from the barrage at Dadupur southwards

Southern Boundary: The confluence of Somb with river Yamuna

Northern Boundary: The Western Yamuna Canal and a road from village Begumpur to Balawala till its confluence with river Yamuna

b) Topography, geology, natural vegetation (forests)

The river Yamuna takes a sharp south easterly turn at the holy city of Paonta Sahib in the state of Himachal Pradesh (HP) cutting through the hills of Shiwalik range to enter the plains of Haryana and Uttar Pradesh (UP). A number of seasonal streams flow down the southern slopes of the Shiwalik range with river Somb being the largest and the westernmost of these. It meets the river Yamuna close to the village of Kanalsi in Haryana.

A barrage stands on the river Yamuna at a place called Hathnikund on the Haryana-UP border and another one stands on the river Somb-Pathrala system at a place called Dadupur.

The Somb-Thapana catchment has a gradually rolling topography which is typical of foothills. Its natural topography has been modified by the Western Yamuna Canal (WYC) which originates from the barrage on river Yamuna at Hathnikund and cuts through the Somb-Thapana system in a westerly direction meeting river Somb at the barrage at Dadupur. The waters in river Somb other than during the monsoon high flows are determined by releases or leakages at the barrage.

Physiographically the region is characterised by a bhabar belt followed lower down by the terai region. Nearer to the river Yamuna both Khadar (flood plains) and Bangar (floodable zone in very high floods) are found.

Bhabar, (after a local tall grass, *Eulaliopsis binata*) are plains which are made up of boulders and pebbles, carried over the years down the river. Many streams flow underground this plain due to its high porosity.

Terai, lie next to the Bhabar plains where the underground streams reappear as surface streams. Soil is moist and alluvial in nature and the water table is high.

Bangar are old alluvial plains formed by rivers which have flowed through this terrain long time back. Fertility of these plains is less as compared to Khadar plains

Khadar are newer alluvial plains and lie in lowland areas after the Bangar plain belt. These plains are of extremely fertile nature.

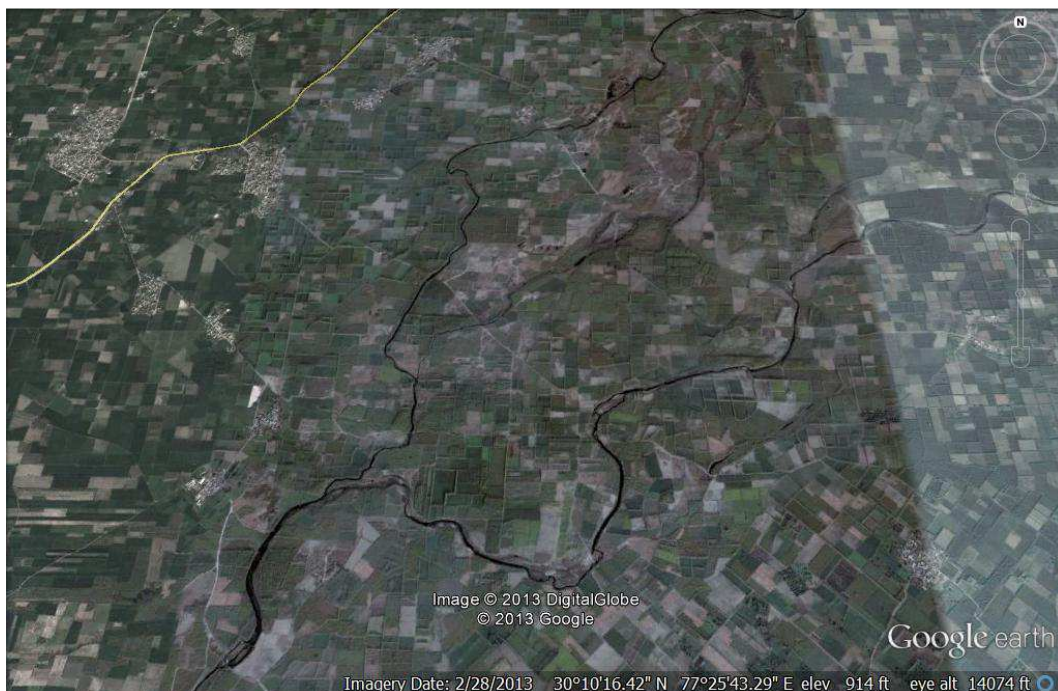
c) Somb-Thapana system and its flora and fauna

River Thapana is a tributary of river Somb, which itself is a tributary of river Yamuna. The larger Somb system has its origins in the Shiwalik hills and is a seasonal river, although it discharging significant amount of water into the river Yamuna during the monsoon months.

The River Somb-Thapana system, which is the subject matter of our inquiry, includes but a segment of river Somb, which is downstream of the barrage at Dadupur in the district of Yamunanagar. (**Map 1**).

Thapana system:

A detailed cartographic investigation utilising survey of India sheet no. H43L8 and Google earth image/s supported by field visits and GPS mapping reveal that there are two main streams in the Thapana system, named for convenience by us as Thapana 1 and Thapana 2. (**Map 1 and Google earth image**). They both meet upstream of village Mandawali Gujar, before travelling another 3 km to meet the river Somb, which in turn travel another 1 and half km to meet the river Yamuna near village Kanalsi. The two Thapana streams have their own subsystem of tributaries many of which have since been ploughed over and converted into farm lands or quarried for sand and gravel.



Google earth image (THP 1 on right & 2 on left and their confluence)



Thapana 2 (right) meets 1 (left)

The still remaining tributaries of Thapana 2 which are still identifiable on the ground and carry noticeable flowing water have been named as Thapana 3 and Thapana 4 (**Map 1**). Notably both the Thapanas and their tributaries emerge from the underground aquifers (locally called *choa*) and hence carry clear water at all times including the monsoon season when the river Yamuna carries muddy colored water.



Thapana 2 emerges off a wooded patch surrounded by farms



Thapana 4 (right) meets 2 (left)

Name	Total length km	Origin	Confluences site	Villages in catchment
Thapana 1	15	Kanyawala flood plain	Somb River near Kanalsi	Kanyawala, Bhilpura, Lakad, Mali Majara, Nawajpur, Soundhebas, Gadipur, Madoli, Mehra majara, Kanalsi
Thapana 2	12	Dadhawa forest	Thapana 1 Near Madoli	Dhadwa, Bichpuri, Rampur Khadar, Haldari, Jairampur, Damopura, Madoli
Thapana 3	3	Near Lakad	Thapana 2 close to a temple of Rampur khadar village	Lakad, Bichpari, Rampur khadar,
Thapana 4	5	Forest of Rampur khadar	Thapana 2 Near Damopura	Rampur khadar, Haldari, Jairampur, Damopura

A rapid field survey by a team led by Mr Nishikant Gupta along both Thapana 1 and 2 carried out from 2 – 10 December 2012 reported the following:

Fauna:

S.No.	Order/Family	Number of Species
1	Mammals	05
2	Birds	79
3	Butterflies	07
4	Dragonflies	05
5	Fish	12
6	Reptiles	03
7	Amphibians	01

Checklist of Fauna annexed as **Annexure 4**

Flora:

The catchment was originally characterised with farm lands surrounded by large patches of scrublands carrying the typical bhabar scrub thorny vegetation of *Acacia arabica*, *A. catechu*, *Dalbergia sissu* and their associates like *Zizyphus sp* and *Syzgium spp*; . Riparian grasses and sedges abounded along the Thapana streams.

Since then plantations of Eucalyptus and Populus have been raised at many places in the catchment.



Poplar plantation on river bank

On account of extensive farming going on in the catchment area, there is little riparian vegetation left along the stream banks, except in the two forest areas which lie within the area of study and from where Thapana 2 and its associate Thapana 4 emerge. **(Map 1)** Tall grasses and sedges can still be found in pond like situations within the stream/s.



Sedges on the edge of the Thapana stream

Of the two notable forest patches in the catchment, one with an area of around 200 ha lies near village Deodhar and Mujahidwala and the other a much smaller patch lie close to village Rampur Khadir. The larger patch is a government forest named as Mujahidwala PF (Protected Forest). Interestingly as mentioned before that Thapana 2 originates from the Mujahidwala PF while its tributary Thapana 4 originates from the other forest patch. **(Map 1)**

Social

There are in all 31 villages that fall within the catchment area. Out of these 18 namely Deodhar, Begumpur, Ismailpur, Darwa, Nathanpur, Bichpari, Kaniawala, Lakur-Bhipura, Mali Majra, Rampur Khadir, Telipura, Haldari Gujar, Damupura, Mehr Majra, Kanalsi, Mandawali, in Haryana and Ghyasiddunpur and Sondhibas in UP are the major human settlements. **(Map 1)**.

d) Demography, occupation

A total of around 29143 persons in 4559 households reside in 31 villages in the area. There is a school in 61% of the villages and around 90% of the villages have been electrified. A primary health centre exists in 32 % while drinking water supply covers

97% of the villages. All weather roads and bus service connects 48% of the villages. **(Socio-economic survey results are in Annexure 3)**

Farming is the predominant occupation of the local people. Key crops raised are wheat, rice and sugarcane. Riverine seasonal farming in flood plains for cucurbits and vegetables is also common. Poplar (*Populus ciliata*) is a common tree crop the soft wood from which is used primarily in the ply wood industries located in the nearby town of Yamuna nagar.



A small percentage of people are also engaged in local petty businesses, shops and animal husbandry. Till the recently imposed prohibition on unauthorised gravel mining, a number of people were also engaged in tasks related with collection, processing and transport of processed gravel from the river bed as well as from some farm lands/scrub lands broken for the purpose.



Scars left from previous gravel mining in Thapana 2 catchment

e) Health and sanitation

The people are by and large healthy although the ill effects of chemical farming are beginning to tell adversely on the general health of the local people. Diseases like diabetes, high blood pressure, and cancer which were previously unheard of have come to be reported from the area in increasing frequency.

Poor sanitation in form of open defecation and waste water standing on village streets and road sides is a major health hazard for all age classes, but more so for the children. Mosquitoes abound and high water table in the area adds to the water logging problem.

Education

The region is well serviced through a number of schools functional in many villages / localities. The government schools carry good campuses, building and qualified teachers.

The Thames-Ganges twinning project has tried to involve children in schools in Kanalsi, Bhogpur and Madoli villages under the Yamuna Eco Scholar, YES program, where school children have been exposed to various environmental issues like river health, sanitation, water testing, organic farming, bird watching etc. The members of the YES joined the NMM in observing the World Rivers Day 2012 as the Thapana Diwas (Day for the river Thapana).

Economic

f) Land use

The key land use in the area is agriculture. Some land has been broken in the past for boulder and gravel mining. Instances of farm lands bought by absentee land owners who do not reside locally and those lands being farmed by hired hands is on an increase.

There are no polluting or major industries located till now within or in the vicinity of the catchment, although with the opening of the area through a major road under construction which is planned to join Yamuna nagar in Haryana with Dehradun in Uttarakhand, such polluting influences might find entry into the catchment area.

g) Road building

The area is criss-crossed with a network of black topped as well as kuccha roads and the condition of majority of them is poor to very poor. A number of causeways and few bridges have been raised. Many of these cross the active as well as some

passive channels of river Thapana. A major road and a bridge lie on the river Somb. A major upgradation of a PWD road which joins the key human settlements in the area is currently underway.



Culvert on river Thapana

4. Challenges and opportunities faced by the catchment

The Somb-Thapana catchment is an outstanding example of the influent action of aquifers recharging a stream during low or no rainfall period. Also how a smaller aquifer fed stream/s can feed a much bigger but seasonal river like Somb and in turn the river Yamuna is an interesting feature.

The above quality while on one hand provides to Thapana a special status, its smallness makes it highly vulnerable to deleterious actions compromising its integrity as a perennial stream.

SWOT (Strength, Weakness, Opportunities and Threats) on Somb-Thapana system

Strength

- Thapana system is an excellent example of aquifer fed perennial stream.
- Somb although a seasonal (monsoon and rain fed) river is also being used as an escape channel at the barrage at Dadupur during high flows in river Yamuna fed Western Yamuna Canal (WYC). Hence it continues to get some discharge from time to time and thus its aquatic and riparian features in form of flora and fauna remain visible and active.
- There are two major channels (Thapana 1 and 2) and few side channels of river Thapana which are active round the year. Thapana 2 carries more quantity of water than Thapana 1.

- Natural riverine vegetation can still be found at most places alongside river Somb and at some stretches, especially where two or more streams meet in the case of Thapana.
- Forests at two sites (**Map 1**) provide good catchment conditions for Thapana 2 and Thapana 4 respectively.
- Good faunal presence has been reported both in Somb and in Thapana.
- The members of Nadi Mitra Mandali, NMM at Kanalsi have taken upon themselves the task of protection of Thapana with a missionary zeal.
- The Somb-Thapana catchment lying in north east corner of the state of Haryana is relatively still secluded from the ill effects of urbanisation.

Weakness

- No legal prohibition exists on the abuse of channel, water or banks of the streams
- Poor protection of catchment forests
- No single agency in-charge of the protection of streams and rivers
- Highly reduced or little flowing water in river Yamuna for major part of the year
- Past floods in Somb and Thapana have made them unpopular with local people
- Bhabhar tract provides easy access to boulders and gravel for mining
- Bhabhar-terai tract ensures high ground water and hence little reason to respect flowing streams
- Local preference for chemical farming and raising of Poplar as a tree crop.

Opportunities

- Restoration of Somb -Thapana system as a fine model of river restoration works
- Local interests resulting in a Community Conserved River endeavour
- Learnings from Somb-Thapana motivating robust legal protection for all rivers and stream in the state
- Effective promotion of Natural / Organic farming for streams and water security
- Catchment becomes an attractive site for an open air and adventure filled schooling and nature education site
- Development of a natural stream and rural tourism (Bird and nature watch)
- Better appreciation of bhabhar-terai stream systems by researchers and research institutions
- Improved community participation in protection of catchment forests
- Halt in conversion of riparian lands for farms and other incompatible uses

Threats

- Poor appreciation amongst locals of the intrinsic and material values of the Somb and Thapana for local welfare

- Absentee land owners have little stake in protection and conservation of local environment including streams
- Hunger and greed for more and more land for farming purposes result in farmers breaking the stream banks for inclusion into their farmlands.
- Resort to chemicals and artificial fertilisers and pesticides polluting the streams through run off.
- Breaking of good agricultural land for gravel mining
- Poaching for birds, fishes and turtles.

5. Action Plan

An action plan is needed for the following:

A) Maintain/improve quantity of water in the streams

a) Integrity of streams and their catchment

Current tendency of local farmers to infill streams (see pics...) and devastate the stream banks or at worst plough over the stream itself is self defeating and highly risky. Such action one hand reduce flows and on another increase flood risks.

Action by

- Individual farmer through better understanding and realisation
- Community disapproval
- Religious sanction against breaking of stream banks
- State through institution of legal prohibition on breaking of stream banks

b) Maintain and increase forest watersheds

Existing forest patches and tree lined stream banks need protection to increase quantity of water in streams in the lean season

Action by

- Individual farmer through maintaining a safe distance from riparian vegetation existing along stream banks
- Community led demarcation of riparian limits
- Forest department to enhance protection of forest patches and regulate any tree felling in riparian zones on stream banks

c) Maintain existing wetlands in the stream/s

There are a number of interesting and sizeable wetlands lying within the streams especially upstream of culverts on them. These wetlands act as habitats to stream biodiversity as well as source of water supplies to the streams. These also buffer the stream from polluting influences.

Action by

- Individual farmer by not encroaching onto the wetlands
- Community disapproval of encroachments into wetlands
- State protection to such wetlands

B) Improve quality of water in the stream/s

a) Promotion of natural / organic farming

Toxic run off into streams from the agricultural crops sprayed with pesticides and herbicides is the major source of pollution of water in the streams. This requires to be checked. Promotion of natural and organic farming shall be useful for this. This shall also help in improvement in health of people, water and soils.

Action by

- Individual farmer by adoption of natural and organic farming
- Religious promotion of natural farming
- NGOs and State agricultural department and research centres

b) Improved waste water and solid waste management in villages

It has been seen that waste water and solid waste generated in villages is finding its way into the streams. This needs to be halted.



Trash finding its way into Thapana bed

Action by

- Individual villagers recycle their water and solid waste
- Religious promotion of waste management
- NGOs promoting waste management

c) Maintain buffer / riparian zones on stream banks

Vegetation in buffer and riparian zones on stream banks help clean the water entering streams.

Action by

- Individual farmer by keeping a distance from stream buffer vegetation and riparian zones
- Community led definition and protection of buffer limits on stream banks
-
- d) *Prevent use of poison during fishing*

It has been seen that some people tend to use poison to fish in stream wetlands. This needs to be halted.

Action by

- Community led disapproval and stoppage of the use of poison to fish by some people
- Religious sanction on any fishing through use of poison
- State fishery department through strict preventive action
-

C) Protect and conserve stream biodiversity

a) Buffer and riparian zones for biodiversity

Adequate buffer and riparian belts along streams harbour key stream biodiversity in form of plants (herbs, shrubs and trees) and animals (small mammals, reptiles, birds and insects). These belts need to be protected and conserved.

Action by

- Individual farmers by respecting the buffer and riparian zones along streams
- Community led campaign to protect and preserve buffer zones
- Government rules and regulations to protect and preserve these zones along streams
- NGOs

b) Stream wetlands as biodiversity habitats

Stream wetlands at various points in the stream act as depository of key aquatic biodiversity (flora, fishes, reptiles, crustaceans, birds and insects). These require to be protected and conserved.

Action by

- Individual farmer by keeping a safe distance from these wetlands
- Community led action to highlight the values of these wetlands
- State action to provide statutory protection to these wetlands
- NGOs

c) Control on poaching

Poaching of stream biodiversity specially fishes is a problem in the area which needs to be controlled.

Action by

- Community led campaign against poaching
- Religious sanction against poaching
- Fisheries department to enforce strict fishing regulations
- NGOs

d) Prevention and control on invasive species

Invasive species of both plants and animals (especially fishes) can become a threat to the stream biodiversity. This needs to be checked.

Action by

- NGOs to investigate and suggest actions
- Community to take remedial measures
- Government departments (Forest, Fisheries) to become proactive

e) Prevent removal of sand and gravel from stream banks

Sand and gravel mining from stream banks and bed is a serious threat to stream integrity, stability and biodiversity. This needs to be checked.

Action by

- Government needs to regulate sand and gravel mining in accordance with the law, rules and regulations
- Community disapproval of sand and gravel removal from stream banks and bed
- NGOs

D) Promotion of recreational and educational values of streams

a) Somb-Thapana catchment as open air and adventure school

Nature education commonly called as EVS (Environmental Studies) has today become an integral part of school curriculum at various levels. The Somb-Thapana catchment could be gainfully utilised by local as well as nearby town schools for hands on practical learning as well as adventure outings for their students.

Action by

- Principal and managers of schools
- State department of education
- Community promotion of such visits
- NGOs

b) Nature (Bird, fishes and insect) watch trips and camps

The natural values of Somb-Thapana catchment are varied and attractive. Nature watch trips of nature lovers for watching birds, fishes and insects etc could help maintain natural values of the area as well as provide livelihood opportunities to local people through provision of various services including stay, food and guide.

Action by

- Community promotion of such visits
- Individual provision of visitor facilities like stay, food and guide
- NGOs

c) Scientific studies in Somb-Thapana streams

Somb-Thapana catchment provides good opportunities to research institutions and researchers to research, document and understand the natural stream dynamics, interplay of aquifers and stream flows, and human impacts on them.

Action by

- Research institutions like the Wildlife Institute of India, Dehradun, Wadia Institute of Geology, Dehradun, Haryana agricultural University, Hissar, etc
- NGOs
- Community promotion of such research endeavours

WHAT CAN YOU DO

.....if you are an individual **farmer**, you can help river Thapana

- through improved understanding and realisation of its values
- through maintaining a safe distance from the stream buffer and riparian vegetation existing along the stream banks
- by not encroaching onto the wetlands existing within the Thapana system
- by adoption of natural and organic farming so that farm run off does not pollute the river
- by not polluting the streams in any manner
- recycle farm water and solid waste and dispose safely and away from the streams such waste that cannot be recycled

.....if you are a member of **community** organisation, you shall assist

- Community led demarcation of buffer strips and riparian limits of the river streams
- Community disapproval of encroachments into stream buffer and wetlands
- Community promotion of natural farming
- Community promotion of waste management

- Community disapproval and stoppage of the use of poison to fish by some people
- Community campaign to protect and preserve buffer zones
- Community action to highlight the values of stream wetlands
- Community campaign against poaching
- Community disapproval of sand and gravel removal from stream banks and bed
- Community promotion of educational and recreational visits to the Somb-Thapana streams
- Community promotion of research endeavours in Somb-Thapana system

.....if you are a **religious leader**, you can help river Thapana by

- promotion of organic farming
- exhorting farmers not to break the stream banks and to respect the stream buffers, stream wetlands and aquatic and riparian biodiversity
- dissuading people from poaching
- suggesting people not to pollute the wetlands and streams

if you are a **NGO**, you can help river Thapana by

- promotion of rich and unique stream values and the biodiversity of river Thapana
- promotion of improved waste management
- promotion of actions for prevention and control on invasive species
- promotion of protection of buffer and riparian zones as well as biodiversity of Thapana system
- promotion of recreational and educational values of stream
- promotion of Nature trips/camps
- promotion of scientific studies in Somb-Thapana system

.....if you are a **state agency**, you can help river Thapana by

- institution of legal prohibition on breaking of stream banks
- enhance protection of forest patches and regulate any tree felling in riparian zones on stream banks
- protect wetlands in the streams
- strict preventive action in fish poaching
- regulation of sand and gravel mining in accordance with the law, rules and regulations
- organisation of nature camps and education
- research institutions like the Wildlife Institute of India, Dehradun, Wadia Institute of Geology, Dehradun, Haryana agricultural University, Hissar, etc to promote scientific studies in Somb-Thapana streams

SUPPORTERS

This document was developed by the PEACE Institute Charitable Trust, Delhi in association with the UK based Thames Rivers Trust, TRT as part of the Thames and Ganges Twinning Project. This Catchment Action Plan was developed to encourage and assist the sustainable use of water, land and natural resources in the Somb and Thapana catchment for the long term benefit of its people, economy and environment. The PEACE Institute (www.peaceinst.org) is a not for profit organisation dedicated to nature conservation as a means to promote peaceful co-existence. Thames Rivers Trust, TRT (thamesriverstrust.org.uk) is a registered environmental charity dedicated to improving the River Thames, UK and its tributaries to benefit people, wildlife and water quality.