

Urbanization and Environment
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Module - 05
First Hand Narratives: Learnings from Research Projects
Lecture - 38
Informing Urban Disaster Studies Using Comparative Urban Environmentalism

So, hello everyone, today I would be shading light on two cities. So, one is a French city, Arles, Southern part of France and the other one is our very own Kolkata, India and you have heard a lot about Kolkata, Kolkata's urban environment more specifically her water bodies wetlands in the form of wetlands, canals creeks, rivers, etcetera, but this is a different kind or a unique kind of a case study which I would be actually discussing from again one of our project experiences.

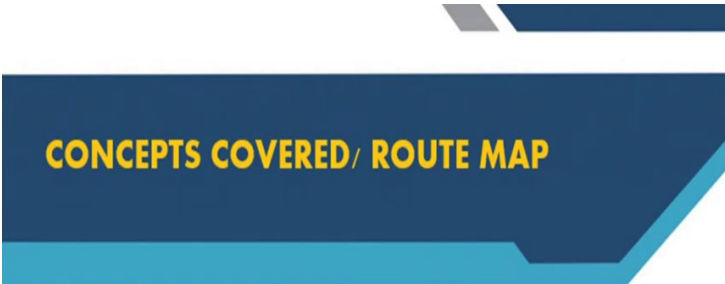
So, this is an ongoing project which is being funded by the EU and also ICSSR. So, ICSSR is our host or the funding agency from India and EU is a funding agency from Europe. So, three countries are involved in this particular project where we are basically kind of you know comparing unexpected comparisons in that sense which may apparently appear to be you know kind of unexpected consequences or rather unexpected comparisons.

So, this is again, this that is why I have put it within this particular module where we are basically discussing lessons from research, projects ongoing research projects because then this gives me the opportunity to kind of discuss and bring to the for, first hand narratives you know from the field.

And what I would like to argue here is that, through this particular comparison which is again I am highlighting on this, that this is unexpected this may apparently appear to be unexpected comparison and then I will also justify that why you know we remain bold to kind of a plunge into this comparison and take it forward and what kind of lessons could we actually learn from this comparison by applying you know the comparative urbanism tactics and why and deployed it within two different cities , one from the global North Arles , France and global South , Kolkata, India.

So, and I would also like to say that you know I feel that these kind of a comparative approach is important because it informs urban disaster studies. So, we here use comparative urban environmentalism to kind of inform and provide inputs to the existing literature or the existing you know policy documents for that matter. So, the kind of arguments that already prevail in the policy circles you know from the global to the local level. So, I think this kind of an comparison has merits to inform urban disaster studies.

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CONCEPTS COVERED/ ROUTE MAP

- Arles-Kolkata comparative investigations
- exploring co-production of urban deltas
- complicating vulnerability/resilience (mainstream) relations
- Inactivating flood memories as the useful tactic

So, yes here I will be discussing this Arles Kolkata comparative investigations and lessons from the field, and this is an exploration on the co-production of urban delta scapes because climate change, cities, deltas these are the things which are being constantly discussed by you know agencies like the United Nations, OECD, World Bank, etcetera because there is a general understanding that the coastal areas and more specifically the coastal cities, the delta cities of the global South, they are facing, they are encountering impending crisis mainly in the form of sea level rise, in the form of flooding, in the form of cyclones, etcetera.

So, it is important, very important at this crucial juncture to basically try to explore unveil and unpack the coproduction of urban delta scapes and what kind of you know processes they are at play.

So, it's important to understand the interplay of variables that make this coproduction possible, right, and as again you know as a social scientist quite being assured you know

about the significance of the application of urban environmental social sciences frameworks, I think this kind of comparisons, this kind of investigations, this kind of social sciences explorations can actually complicate the so, called mainstream you know vulnerability resilience understanding or the kind of relationship that is projected in this mainstream discourses.

And finally, in this particular lecture through these two cases and the case study approach, I would also like to draw your attention to the fact that why and how reactivation of , or reactivating flood memories can really be a useful tactic so, far as disaster or resilience research is concerned.

Now before I start with this presentation, I think I would like to read out from my field diary. So, I would like to read out from extracts, of my field diaries I mean different pages. So, I would like to read out from three different you know entries from my field diaries and then I will explain that why I felt you know this exercise to be significant so, far as this particular lecture is concerned.

So, let me just read out the entries. So, the first entry is from June 10, 2016. We are in Leo France, standing on the embankment of the Rhone river. Rhone has been etymologically associated with to run to Rhone. We reach Arles during the afternoon. Our discussions with public environmental actors from conservator do literal sorry for my French pronunciation, park natural regionality command and CPIE local environment education association are fruitful.

Representatives from CPIE Rhone join us on a visit of the Camargue festival, the vast saline delta and marshland between the two arms of the Rhone spreading like a fan from the city of Arles bring, be a testimony to its long history and culture.

The 1859 sea dyke indicates the states heavy reliance on its technological apparatus to protect the region from flooding. The river reflects efforts of severe straightening and embanking as part of flood control measures. The route from Leo to Camargue through Arles validates the history of a series of interventions to tame the Rhone valley and the delta.

Now, I would read out the entry from February 2ND , 2017. Its a wintry morning and the Ganga river mouth appears misty. We discuss how Sagar, place of Hindu pilgrimage at

the confluence of the river and the sea is shrouded in mythologies that encapsulate the essence of the delta scape. Long concrete embankments dilapidated in some areas, makeshift houses and cyclone shelters in school premises point to the frequency of floods and environmental risks in the Sundarbans and the continued saga of human adjustments to hydrological extremes.

The final entry is from the next day that is 3RD February, 2017 and I write, I wrote we have now moved northward from the delta and reached the vast watery world intermitted by lush green patches. The East Kolkata wetlands the life of Kolkata.

It is a long and hectic day packed with interviews and informal on site conversations the vivid descriptions by irrigation officials, municipal engineers, fishers and bheri owners as well as our own visual immersion while crossing age old elaborate technological arrangements such as sluices, log gates or pumping stations confirm flood vulnerability of the city and its responses to risks since historical times. So, these are increased from 2016 and 2017.

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Urban Deltascapes: Arles and Kolkata

- discovering similarities and specificities that shape floodplains and urban areas across varied geographies
- getting motivated to critically interrogate global discourses on floods, vulnerability and resilience
- problematizing global North and global South as binaries in disaster studies
- engaging in hydrosocial analysis of flood paradigms and management in the Rhône and Ganges basins

And I must say that you know there is a history, there is a like 5 years history to how we become really interested to do this comparative study between the Rhone delta and the Ganga delta. So, it also involves you know personal relationships, associations with likeminded people and then whole lot of conflicts and discussions and debates you know

between myself and my project partner based in France, who was actually trained in civil engineering.

But then became more interested in social sciences because she worked with the policy makers and later she also became associated with IUCN and she could feel from inside that you know social science insights, how social science insights remain crucial you know, to understand natural disasters, to understand that natural disasters are not only natural, but it also involves you know a whole lot of social variables, aspects and parameters.

So, I am not going to into the personal story because otherwise you know the this lecture would be unnecessarily stretched, but later you know in the discussion forum or when we get opportunities to you know discuss in live sessions through question answer round, I would be very happy to discuss more about you know these personal stories that actually set the scene created the ambience and also kind of provoked us to plunge into this kind of comparative study between the Rhone and the lower Ganga basin.

So, we became extremely instigated , to discover similarities and specificities that shape flood plains and urban delta scapes across varied geographies.

So, here I would like to kind of deconstruct this binary between global North and global South because like if you make a comparison between two cities or for that matter you know even two delta scape, one from global North and one from the global South, then there are risks because people may say that you know they are varied, they are varied geographies, they are varied you know cultural spaces. So, is it right; is it right to kind of do a comparative study between this otherwise you know distinctive territorialities.

So, I think our answer to the question is yes and I , we think that its high time for us to not only deconstruct nature, culture, male, female binaries, but also to deconstruct you know these so, called kind of sacrosanct categorizations like global South and global North, because we feel that you know this really does harm to you know to understand distinctive, but also shared processes you know, that shape you know this particular spaces.

So, yes. So, we became extremely interested to discover the similarities yet specificities, we got motivated to critically interrogate global discourses on floods, disasters

vulnerability and resilience because this literature has now you know has kind of got a consolidated shape.

So, for example, I am definitely thinking about the disaster reports, which have been published from the United Nations disaster office and also the reports by OECD, the reports by World Bank, the reports by National Geography several other international organizations for that matter, which kind of you know talk about straight jacketed one size, same size fits all kind of you know solutions and provide us with globalist prescriptions that these are the; these are the ways through which flood should be mitigated or these are the ways through which you know adaptation practices should be pursued.

But I mean we thought of kind of complicating this whole discussion and critically interrogating you know this discourses and discussions on this kind of concepts or understanding of framings like vulnerability, resilience, floods, disasters, etcetera. So, yes we also definitely thought of problematizing global North versus global South in disaster scholarship and we wanted to engage in long term hydro social analysis of flood paradigms and management practices in the Rhone and Ganga basin.

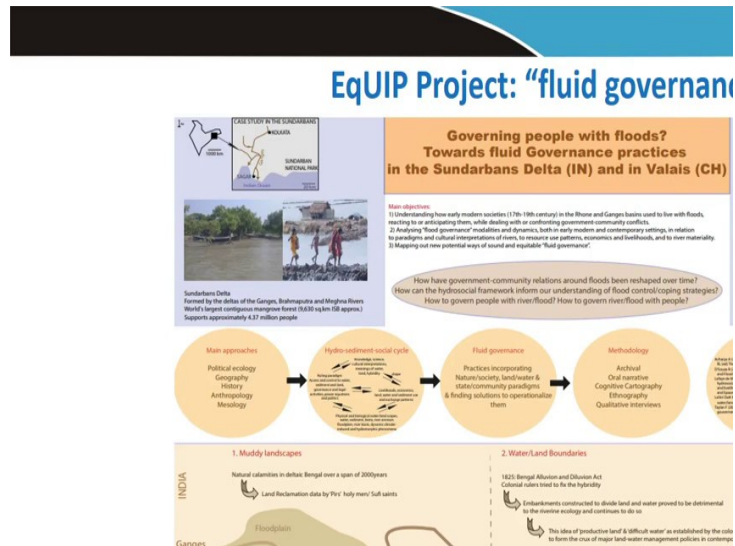
So, yes our political ecology perspective and our like training or expertise in social science domains or humanities domains like history, environmental history, interdisciplinary frameworks and communities of practices like you know political ecology, hydro social paradigms, etcetera; we thought could be extremely significant to understand and unpack flood paradigms and water management in across varied geographies, across different you know delta scapes including urban delta scapes.

So, yes archival and ethnographic explorations of the interaction of flood risk and human adjustments in this distinct yet comparable spatial and political settings have provided a means to reinvigorate global environmental history that is sensitive to local differences, is very very important. So, yes, we got motivated to reinvigorate global environmental history which is sensitive to local differences and complexities, but which conveys the global by mapping and accommodating together similar historical trajectories of change along varied geographical context.

And this is how we also kind of you know, also we recently wrote an article and fortunately this has been accepted and this will come out soon I think by the time the

course gets launched, I will be able to provide this reading material to you where the research teams from these three countries Switzerland, France and India we have then you know shared our, shared our experience and our lessons from the deployment of comparative urbanism or global urban environmentalism in this diverse geographical and across this diverse geographical and cultural context.

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So, this is part this case study Arles Kolkata comparison or this Arles Kolkata investigation, it is part of the larger u ICSSR project that is ongoing that we are presently carrying forward. So, this is the fluid governance project, the equip project on fluid governance where we are comparing the lower part of the Ganga basin, the lower Ganga basin mainly the delta and also the Rhone delta.

So, yes we are also looking into the source of the Rhone bit , which is in Switzerland, but then mainly focusing on the like delta of the role, we are also looking into the other cities like Leo, etcetera, but mainly you know the delta is in Arles. So, Arles is one of the crucial urban sites so, far is so, far as this you know larger project of comparison between Rhone delta and Ganga deltas are actually concerned.

So, if you go through this poster, I will encourage you definitely to go through this poster because this is very very rich. So, you see that you know what kind of you know what provided us with the vantage point to actually carry forward this comparison. So, I would encourage you to because this is very detailed. So, go through the nitty gritty of this

poster and I am sure you will be able to understand that what provoke, provoked us to you know plunge into this particular project.

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- economic prominence in the city
- flood management in the agro-city
- *levadiers* (city officers) were in charge of maintaining dykes along the Rhône
- need to delineate parcels in this muddy and unstable environment as to ensure the protection of property

Yes, um. So, coming to Arles because Arles I think is a new city and it I mean especially so, far as like I mean I think like maybe the Europeans they have a whole lot of understanding about this particular city, but I think people from South Asia they really at least I did not know anything about Arles until recently as part of this you know project or research team.

So, Arles has a very fascinating history because like since the Roman times actually and it I mean it was a very prominent city economically because it was located at the, it was a kind of a commercial hub at the intersections of the two roads Le Grau-du-Roi and Aix-en-Provence.

And this city also grew as an agro city because it is located at the delta. So, this is if you see the map, this is the last city before the Mediterranean, the southernmost the part the southernmost tip of the of these, of France and definitely like this is the delta, this is the Rhone delta and it remain connected to the upper Rhone basin through inland navigation.

So, as like it emerges the as an agro city. So, after particular point of time definitely land reclamation became a serious issue, because land reclamation and of course, land reclamation through flood management became an important issue for the city of Arles

and city officers who were known as levadiers were employed and they were in charge of maintaining dykes along the Rhone river.

So, it also as floods were extremely frequent inundating parts of Arles for during, especially in the monsoon season. So, it also became imperative to delineate parcels in this muddy and unstable environment to ensure you know the protection of property.

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Separating Land from Water

- intensive agriculture in the sixteenth century
- 1543 – *Association of Corrège-Camargue Majour*; elitist com
- reclamation of the *Camargue*
- the digging of the Corrège Canal – evolution of the regional basket

Intensive agriculture followed in the sixteenth century. So, a lot of records, land records, revenue records and whole lot of you know historical records which are captured which are there in the form of proceedings and these are all of course, written in French and thanks to our French partners in this particular project. So, we also could learn a lot and there has been real there.

So, we are definitely getting benefited from each others, from each others you know data sets and repositories and also definitely historical sources reports accounts in the form of gazetteers, correspondence, proceedings, land revenue accounts, records, etcetera.

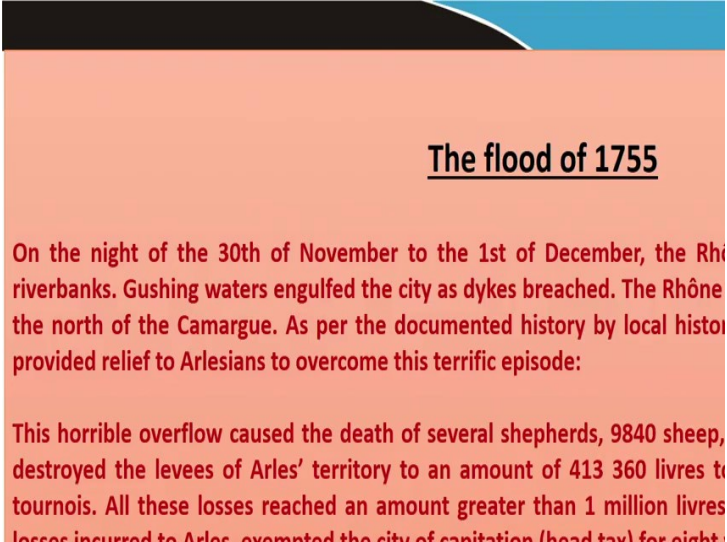
So, yes we get to know from these French records that since the twelfth century, thirteenth century, this land reclamation process has actually started, there were aggressive land reclamation, but this aggressive land reclamations became more aggressive from the sixteenth and seventeenth centuries because now intensive agriculture started in the city of Arles and its larger delta scape.

So, in 14. So, 1543 this Association of Correges Camargue Major was formed and it was mainly formed of the elite Aleutian population or the citizenry and so, for example, out of the 16 members in total like 9 members were from the, from nine members were nobles from the, from nobility and 4, 5 members I think they were also from you know bureaucratic circles and bourgeoisie, the bourgeoisie section mainly and 2 members were from clergy. So, you can understand that this was an elitist group comprising the elitist section of the Aleutian citizenry.

And land reclamation was in vogue and aggressive land reclamation efforts went on I mean through the entire Camargue. So, Camargue implies the delta the, Rhone delta and in during the seventeenth century the Correges Canal was dug, it was excavated and this through the excavation of this canal Arles could actually I mean the interior parts could be connected, the delta could be connected with the interior parts and it definitely facilitated the evolution of the regional bread basket. So, Arles signify the bread basket you know site so, far as the entire delta scape was concerned.

And seventeenth century yes of course, flood control and irrigation works were carried on and carried out by this particular association and the delta finally, got established as the hinterland of the city of Arles, the extremely economically prosperous city harping and harnessing all kinds of benefits from the, from the delta in the form of arable lands, wetlands, from the generation of ecosystem services, etcetera.

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The flood of 1755

On the night of the 30th of November to the 1st of December, the Rhône riverbanks. Gushing waters engulfed the city as dykes breached. The Rhône the north of the Camargue. As per the documented history by local historians provided relief to Arlesians to overcome this terrific episode:

This horrible overflow caused the death of several shepherds, 9840 sheep, destroyed the levees of Arles' territory to an amount of 413 360 livres to tournois. All these losses reached an amount greater than 1 million livres losses incurred to Arles, exempted the city of taxation (head tax) for eight

Yes, but due to this land reclamation activities and the continuous construction of dykes and also you know the separation between land and water. So, when you try to fix fluid scapes, of course, you know history will inform you that the floods become more aggressive, the floods become you know uncontrollable. So, the if you want to interrupt, the uninterrupted flow regime of the river, then of course, their boomerang reaction is bound to happen or and occur.

So, this is what we also find from Arles. Arles also does not remain as an exception. So, we find that number of floods started you know I mean number of, the number of floods actually got it increased, the number of floods increase and not only number of floods, but also the duration and frequency of floods kind of intensified. And I think like in the, at the beginning of the eighteenth century almost like 73 floods occur in the in this delta scape and also Arles face the brunt of it.

And for example, this is a passage which I am not going to read out because its there you can read it out from the PPT itself and this is from this particular you know historical document which is preserved in the ancient archive and this narrates how like all I mean how dreadful the flood of 1755 was and the kind of damages it actually caused you know to the people. So, crop loss, loss of cattle, etcetera.

And it was also getting I mean quite financially, like it was getting financially troublesome, for the association, association the major, to kind of control these floods and like whole lot of money was being spent to incur the cost of effective flood management in the form of you know kind of constructing dykes, repairing them, maintaining their levels, etcetera.

And again from the historical documents, we get to know that the costs to, I mean the cost of this flood maintenance or effective water management, land management system like the cost, actual cost expenses quadruple the cost of the 1756 cost, quadruple the cost of like 1755 and in 1757-58 the cost which were incurred were double you know than the cost of 1755.

So, there was whole lot of financial pressure on the association, but the association also was borrowing money from private groups and also from the state, but what was good was that you know they were also reaping the benefits from floods because after every flood the soil was laden with fertile sediments or silt and definitely after every flood the

agrarian productivity definitely went up. So, that was the only incentive that the land owners were actually enjoying and the association was enjoying.

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The Disconnect

- nineteenth century drainage operations
- the rise of new actors and investors
- the 1805 decree by Napoleon I
 - imposition of poll tax on the landowners; Central Committee
 - centralized control and supervision – *préfet* (prefect)
- inland navigation agenda

Now, during the nineteenth century, massive drainage operations started occurring and there were also the rise of new actors and investors. So, we find also during this time that the state was encouraging along with farming lobbies, other lobbies most importantly industrial lobbies because in 1805 a decree was promulgated by Napoleon I, where he imposed poll tax in on the land owners then a central committee was formed.

So, what we find is that, you know imperial principles were gradually infiltrating you know this particular delta scape and the control and supervision was gradually becoming you know centralized. So, centralized control was a kind of replacing the control by the local organizations and the prefect was I mean was a person to supervise and control you know this land and flood management policies.

And inland navigation agenda also became one of the priorities during the nineteenth century in this particular, in this particular site and between 1817 and 1834 navigation one particular navigation canal there was whole lot of debate about the excavation of a navigation canal on that left bank of the Rhone. But yes finally, there were approvals and this canal was excavated. So, this kind of I mean this disconnected finally, the city of Arles from its larger ecological infrastructures.

And what we find is also that you know Arles bottom up water management prior to the French revolution transformed into a state control project during the beginning of the nineteenth century. So, this was the major changes, this was the major rupture that occurred during the modern times.

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- the flood of 1856; 1857 – integrated vision for river management under the regime of Napoleon III
 - more centralized control and technocratic interventions; colonization of the Camargue
 - building of a massive dyke to meet the interests of the Arlesian landowners
 - the formation of the *Syndicat de gestion des chaussées de Grande Camargue* to maintain the dykes
 - the transformation of the Rhône Delta into an “extractive space”
 - salt production; chemical industries; soda ash; steel industry
 - social conflicts (farming and industrial lobbies) in the Camargue, triggered by clashing actors – **draining versus penetration of seawater**
 - 1897 – a new railway, joining Arles and the newly created industrial town of Salin-de-Gresse

And then floods continued, floods kept on happening with their vicissitudes and 1856 flood for example, was disastrous, then 1857 thus state was bound to have an integrated vision for river management under the regime of Napoleon the third, but the centralized control and technocratic interventions actually increased which led to the colonization of the Camargue.

And there was the building of a massive dyke to meet the interests of the Arlesian landowners because they were complaining against the floods which was and they wanted the flood waters to get quickly drained you know to the Mediterranean sea. So, the *Syndicat de gestion des chaussées de Grande Camargue* was formed extremely sorry and sincere apologies for my French pronunciation as I am not trained in the language.

But anyway the *Syndicat* was formed to maintain dykes and Rhone was transformed into an extractive space and why I am saying this because as I mentioned in my earlier slide that industrial interest, industrial lobbies they started entering into the scene and now you know this delta scape was not only the space for the farming lobby, but also for the, for

this you know capitalist industrial community or section who invested in salt production, chemical industries, soda, ash and steel industry.

So, social conflicts became apparent and evident between industrial lobbies and farming lobbies in the Camargue triggered by clashing interests among actors. Because while the farming class they wanted draining of the sea water you know, draining of these water as fast as possible to meet their irrigation interest or you know their farming interest on the other hand, the salt production lobby they wanted this, they wanted the penetration of you know this sea water to feed their large scale salt bed, right.

So, there were social conflicts, there were clash of interest you know among these or between these groups or lobbies.

So, in 1892 the court then came out with the judgment where the court tried to make a compromise between both these lobbies and so, for example, the state said the court said that yes, the for some time this sea water should be retained to kind of cater to the farming needs, but at the same time, the time frame which will be allowed for this retainment of the flood water during that time the kind of industrial loss which will be incurred by the industrial lobbies, some kind of compensation will be given to them.

On the other hand, you know several other things happened which promoted the interests of the industrial lobby like a new railway; a new railway line was established joining Arles and the newly created industrial town of Salin-de-Giraud and a new salt extraction plant was set up all together in 1895.

And apart from this local events or local occurrences like there are of course, there were global events which also led to the decline of Arles. And the rise of Marseille another Southern city of France over Arles because during this time French colonization was going on, there was this subjugation or annexation of Algeria in 1930s sorry 1830s and then the opening up of the Suez Canal in 1869 and penetration of the French in parts of sub Saharan Africa and Asia and that is why Marseille you know it rose as the port city to expedite this colonial trade.

So, Arles could no longer assert its economic importance neither as a fluvial trading center nor as a strategic bread basket. So, as a matter of fact the delta was ruled by higher interest.

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Damming the Rhône

- 1917 – Génissiat Dam
- opposed by diverging regional interests and powers within the Rhône Valley
- 1933 – the Rhône National Company as the mediating agency
- major dykes from source to mouth
- 1945-1986 – 19 hydropower dams



So, coming to the like final part of this discussion, then you know this interventions went on and on. So, there was whole lot of again debate about the establishment of the Genissiat Dam because like the Parisians they pressurize that this dam should be built just 50 kilometers from Leo, upstream from Leo and then 250 kilometers from Arles.

But finally, you know like of course, there were diverging regional interests and powers within the Rhone valley. So, this dam was finally, you know kind of it got the approval. So, the approval say in 1933 the Rhone National Company was formed to mediate you know this clashes, it is formed with a objective of you know, it was formed with the idea of acting as the mediating agencies.

And then, major dykes were actually constructed during the twentieth century, as well big dykes, concrete dykes, from the source to the mouth. So, and like between 1945 and 1986, 19 hydropower dams were I mean were constructed and during 1970s and 80s five nuclear plants were five nuclear plants also came up and it which drew water from the Rhone to cool down its reactors.

So, there what we find is an entire transformation an alteration of hydraulic regime of Arle, but unfortunately with least benefits for the city of Arles the kind of benefits which it enjoyed during the previous times.

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More Disastrous Floods

- 1993-94 – flooding of 23,500 ha of the *Camargue* @ 30 million euros
- passing the buck
- transformed nature of flood management
 - from a community-based to a (local) public maintenance regime
- 1996 – formation of an association of three municipalities – Arles, Port Saint-Louis Maries-de-la-Mer
- 1999 – formation of the inter-governmental institution – the SYMADREM
- Different opinions: constant negotiations, bargains and compromises

More disastrous floods. So, between 1993 and 94 flooding of 23,500 hectares of the Camargue at the cost of 30 million euros. And we find definitely the thing which is very common which happens that is passing the buck.

So, while the industrial lobbies like they kind of blamed the farming lobby they said that the farming lobbies they what they were doing the farmers were actually they were making holes in the tunnels and they were drilling holes in the tunnels and they were taking the water you know from this from the dykes which did major harm you know to the, to the, to the alluvial fan to this particular bell.

On the other hand, like lot of like lot of complaints were also against the Syndicat and associations which control or which were in charge of flood management. So, finally, what happened is that there a transformation occurred in the nature of flood management and this is absolutely so, from the environmental history of the earlier delta scape it is absolutely clear that how flood management transformed from a community base to a local public maintenance regime.

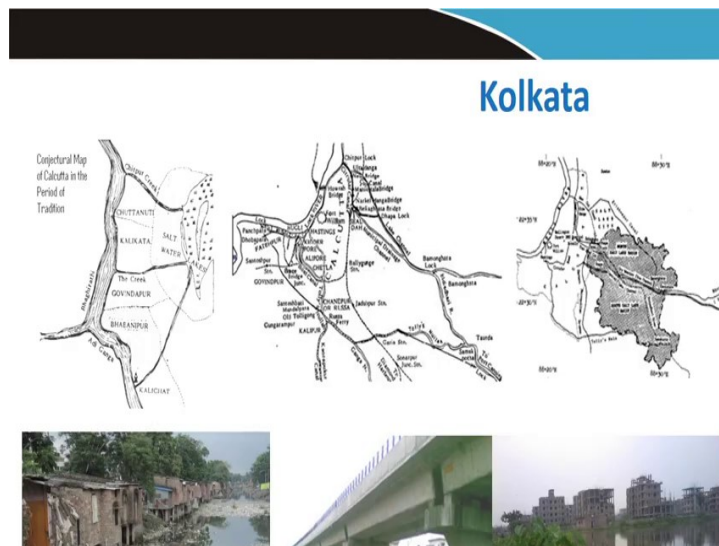
So, 1996 another association was formed from of three municipalities Arles, Port Saint Louis and Saintes-Maries-de-la Mer and in 1999 the SYMADREM finally, was formed as the intergovernmental institution to take care of this entire situation, of the entire command.

Different opinions, constant negotiations, bargains and compromises were met in the meantime in 2003, Arles I mean there was a major flood which hard hit Arles and the delta and people you know the new rural communities they definitely were extreme they were impacted upon severely impacted upon by this flood.

And then the planned Rhone was formulated and executed where regional authorities came together and also this Rhone National Company and European Union came together to kind of strike a balance in the governance of the fluid regime. So, what we find now is that you know like local interest and public interest there is a kind of a compromise has been sought between the two and while the urbanized area have been concretized with dykes and embankments.

On the other hand, like uninterrupted flow of the river has been retained in some parts especially to kind of I mean to cater to the needs of irrigation. So, this is the situation now.

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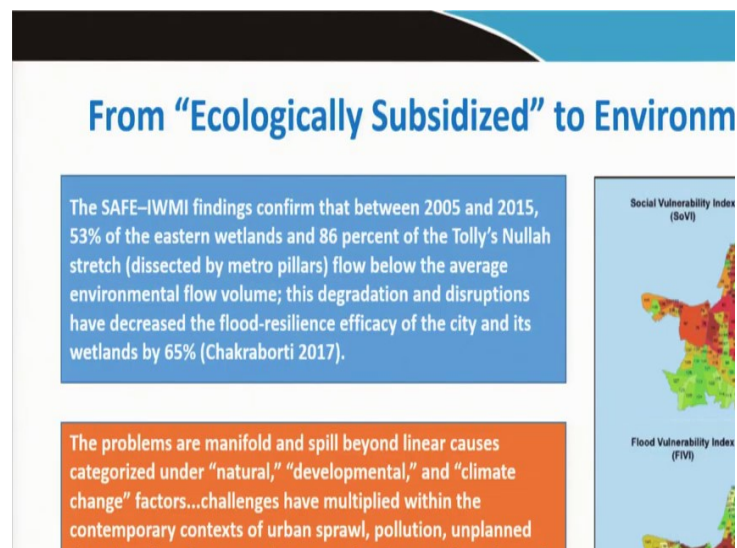


This is very very familiar, I am not going to repeat this story at all. So, we discussed this in detail I think in lecture 34, where I discuss blue infrastructures of Kolkata. I think all these maps are familiar to if you cannot remember go back to lecture 34, where I discuss how and how you know the city of Kolkata was formed and I mean how the city of Kolkata was planned and why the British kind of you know manipulated and tamed her urban ecology and then excavated canals and how this the birth of city of this, Kolkata

city and also the expansion of the Kolkata city it has a parallel history with the stories of the excavation of canals and reclamation of marshes.

And how you know the East Kolkata wetlands was formed and like in the post independence period, the story is definitely dotted with the story of degraded canals and dilapidated stretch of these water bodies and encroached wetlands.

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So, the problem with this is that, from ecologically subsidized Kolkata has become environmentally vulnerable and if you go through several reports, you can understand that how the disruption of the canals and this encroachment upon the wetlands has actually increased it has exacerbated intensified the vulnerability question of the city.

So, the flood efficacy of the city has been absolutely you know kind of impacted upon with this continuous non maintenance or you know the degradation of canals. So, yes. So, I am not going into this Kolkata story at all because I will request you to go back to lecture 34 and try to you know see the points that I made because there definitely I discussed the emergence and the growth and the rise and the expansion of the city of Kolkata from the environmental history perspective.

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Beyond Globalist Prescription

- universal conceptualizations of disasters and of mitigation measures – disastrous
- historical, comparative, in-depth empirical research to complicate global perceptions of environmental risks such as (urban) floods
- case-study based approach, assembling “storylines” – historical coproduction of
- HUPE – collective social stakes in the coproduction of urban deltas through continued collaborations across places and periods and at different scales
- “comparative tactic” (Robinson 2015) – to a more global urban environmental history

Yes. So, coming to the final slide, what I would basically like to say that why again I think or we think that you know this kind of; this kind of lessons from a comparative perspective can actually be helpful. So, we took cues from comparative urbanism because these kind of comparison so, far as you know disasters like floods are concerned is not there. So, that is why we took you from you know from comparative urbanism and that enabled us to you know kind of understand that this universal conceptualization of disasters and of mitigation measures is very very problematic.

So, its actually not only problematic, but its also disastrous and that and why so, as I mentioned that as we took cues from comparative urbanism. So, we could understand that why not only you know this I mean these cities are distinctive spaces, but they also, they have shared histories right. So, they have shared histories and of the making of the urban within the larger dynamics of the delta building processes. And it is important to capture and unveil you know these complex processes these historical processes that are , that are at play you know making of or in the coproduction of this delta scape.

So, historical comparative in depth empirical research provided as the age to complicate global perceptions and prescriptions for environmental risk such as urban floods and this case study based approach enabled us to assemble story lines you know different stories a suppressed stories, repressed stories, dominant stories, etcetera; together to understand to capture to bring to the fore historical coproduction of urban delta scape.

So, HUPE were again discussed in lecture 34, how historical and why historical urban political ecology you know enable us to capture and to understand, collective social texts in the production of urban deltas by mapping array of you know, you know array of events and occurrences that are there, that exist in the form of conflicts, negotiations, collaborations across places and periods and at different scales.

So, yes, that is why we found this comparative tactic to be important to kind of consolidate you know our take or to write a more nuanced global urban environmental history. So, such an unexpected comparison helps us to position delta cities around the globe within larger environmental and political processes while recognizing their situatedness and distinctiveness parallelly accomplishing the grounding and worlding agenda.

So, I am very much influenced by a particular book, by a latest book its an edited volume by the you will see the reference here by Ernstson and Sverker Sorlin. So, Ernstson and Sorlin 2019 its an edited volume. So, which where you find different case studies from both global South and global North you know deconstructing this the binary between global North and global South, where they talk about why parallelly this grounding and worlding agendas are important you know for historians to really advance comparative urban environmentalism.

And what we have done here is that I think we have advanced this further by comparing these two sites in one particular article together.

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So, these are the references.

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CONCLUSION: Key highlights

- floods are strongly dependent on territorial as well as historicized dynamics and
- how the Rhône and the lower Ganga have been built as important axes of trade navigation, shaping the fate and future of Arles and Kolkata respectively
- commonalities yet specificities
- connections at international scales, beyond the north-south binary
- varied sets of socio-technical flood adaptation responses – multiple actors. clash

And yes. So, I would like to conclude by saying that these comparative study helped us to or rather we already had this idea, but through the case study now we can attest that floods are strongly dependent on territorial as well as historicized dynamics and negotiations. So, they are more than they are beyond geomorphological and geo-hydrological processes.

So, we could see how the Rhone and the lower Ganga have been built as important access of trade and inland navigation shaping the fate and future of both Arles and Kolkata respectively and this case study, this comparative global urban environmental approach helped us to trace commonalities yet specificities of the shared yet distinctive you know processes of the making of the urban environment within the larger context of the delta building processes.

So, we could understand that varied sets of socio technical flood adaptation responses are embedded in this stories involving multiple actors, clashing and their clashing and converging interest and as I mentioned in the, at the beginning that vulnerability and resilience their relationship does not always remain linear.

And also you know it is important to re-ontologize vulnerability and you know resilience for that matter because vulnerability in disaster studies, disaster scholarship and disaster policy prescription is often projected as the negative scenario and resilience is kind of portrayed as the positive scenario. But I can show or we can really there are cases

through which we will be able to argue that vulnerability and resilience sometimes they are not you know they kind of share a directly proportional relationship with each other.

So, it means that you same kind of situation can actually decrease or rather actually decrease vulnerability and at the same time also decrease resilience. So, for example, if you build and concretize you know dykes in a flood plain, then what happens is that for a long period of time settlements are encouraged in that region and the community forget about the floods. So, the flood memories get deactivated.

So, this dykes not only impact flooding, but they also impact flood memories and in that way impact the capacity of the communities to react to a major flooding if there are like I mean massive flows during the peak flow season or there are incidents of embankment breach and dyke breaches.

So, finally, you know this case study base approach and Arles Kolkata investigation through this we would like to conclude that delta cities are imbued with flood efficacy and that is why we argue that reactivation of flood memory can really be a very significant strategy and tactic you know in disaster scholarship.

So, I would like to finally, end with this particular reference which I just could come across very recently. So, this is a book by, I mean its a compilation of several experiences from flood management projects in I think six of these projects from four countries in Europe and this is this book is called flood scapes by Frederic Rossano, where he says that you know there are different stories there are multiple stories permeated through history of both worship and fear so, far as human relationship with flooding is concerned.

So, flood mitigation and flood adaptation processes they need to be embedded you know at local spaces and very much embedded with the cultural trajectories of a particular space and you know flood adaptation or flood mitigation has to take into consideration several things like you know nature, tourism, agriculture even urban development and that is why urban designers, planners and flood architects they have much role to play in this entire venture.

So, yes that is why it is very very important to you know to kind of learn from or learn lessons or look back to what happened in history and to understand flood as a very strong

you know historicized process or as a process that you know, that kind of has , or that is imbued with territorial plus as well as historicized dynamics and negotiations.

Thank you.