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Man-Waters Interactions in the Po River Delta
Emilia-Romagna Sector

Land Reclamations: Geo-Historical Issues in a Global Perspective
International Conference

University of Bologna
May 14th, 2010

Field Trip Guidebook

Man-Waters Interactions in the Po River Delta – Emilia-Romagna Sector Field Trip was organized in the framework of the International Conference *Land Reclamations: Geo-Historical Issues in a Global Perspective*, held at the University of Bologna (Italy) on May 14th, 2010.

The scientific event was sponsored by the Institute of Advanced Studies (ISA), University of Bologna, in the framework of ISA Topic Grant 2010 *Water Resources Management: old and new Approaches* (coordinators Carlo Cencini and Franco Cazzola).



ALMA MATER STUDIORUM
UNIVERSITA DI BOLOGNA

Land Reclamations: Geo-Historical Issues in a Global Perspective International Conference
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Italian Army Geographical Institute (IGM) maps are published under licence no. 6568 (March 16th, 2010).

On the binding: “Umana” dewatering pump, dating to the ‘30s of the 20th century. Anita, Argenta Municipality (Ferrara Province, Northern Italy). *Photo*: S. Piastra, 2010.

On the binding background: Comacchio wetlands (Po River Delta, Ferrara Province, Northern Italy) from a map dating to 1851. *Source*: REGIONE EMILIA-ROMAGNA, IBC EMILIA-ROMAGNA, *Usa del Suolo Storico. Carta Storica Regionale*, DVD, 2007.

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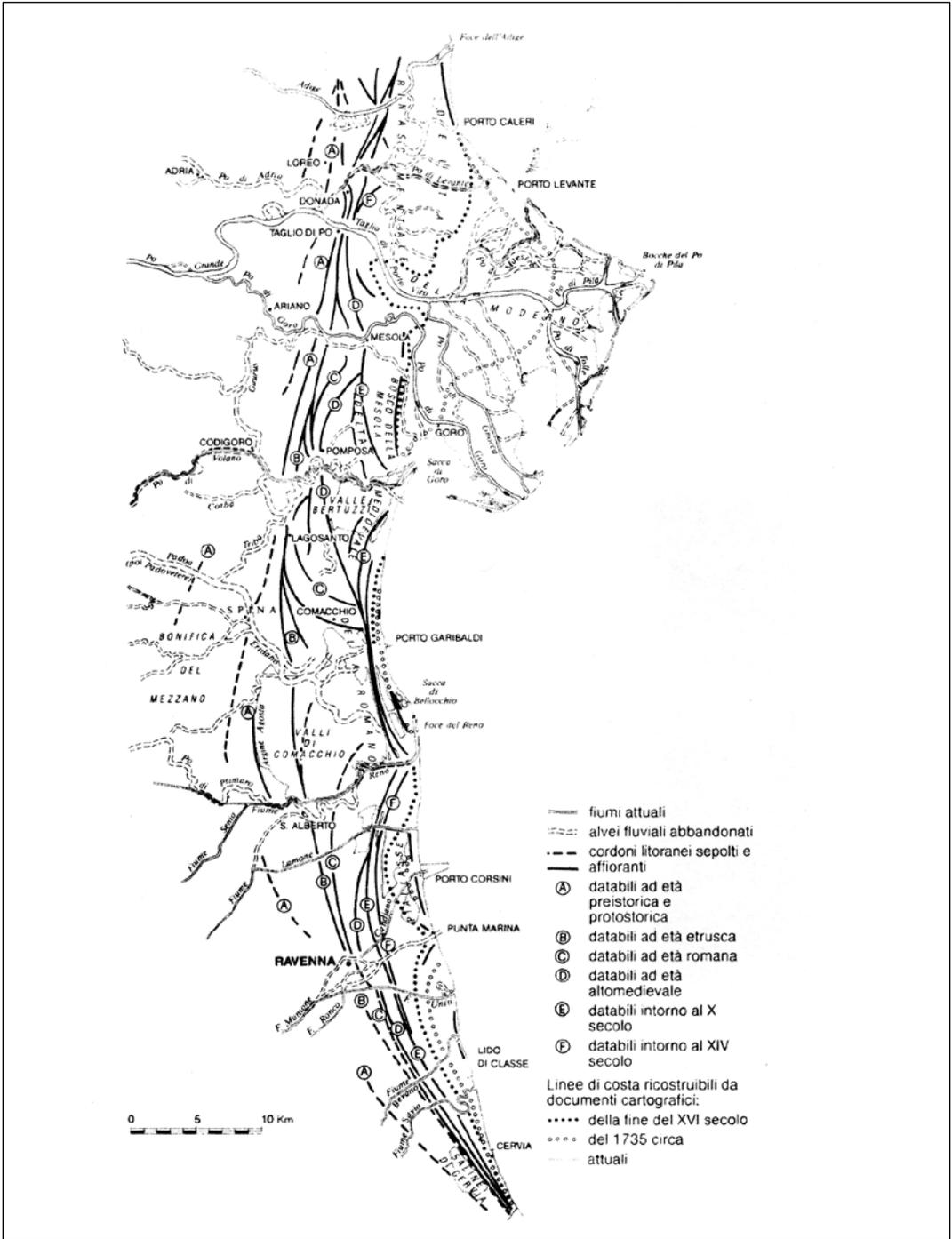


Fig. 1 – Po River Delta evolution (Northern Italy) from pre-historical times to the present. Letter A indicates pre- and proto-historical coastline; letter B, Etruscan Time coastline; letter C, Roman Age coastline; letter D, Early-Medieval coastline; letter E, 10th century AD approx. coastline; letter F, 14th century AD coastline. The peninsula on the top of the figure, which lengthens towards the Adriatic Sea, currently located in Veneto region, dates from 16th-17th century to now. *Source:* BONDESAN 1990.

Introduction

The field trip, entitled *Man-Waters Interactions in the Po River Delta – Emilia-Romagna Sector* and organized under the umbrella of University of Bologna in the framework of the International Conference *Land Reclamations: Geo-Historical Issues in a Global Perspective* (May 14th, 2010), implies a multiplicity of geographical themes and areas indeed.

The excursion involves both the Ravenna and Ferrara Provinces, which are part of Western Romagna and part of Eastern Emilia regions, in Northern Italy, allowing the participants the opportunity of an overview of the main physical and human issues in the Po River Plain and Delta, concerning man-environment interactions in general and man-waters ones in particular.

Stops and topics were chosen among many others in the attempt to give exemplificative and paradigmatic case-studies, with regard to the most relevant historical periods for hydraulic works in this zone (Modern Age, second half of the 19th century, Fascist Age, '50s-'70s of the 20th century).

Most of the stops are related to rural themes, but the last one (Comacchio city, no. 7) deals with urban and socio-economic studies.

The excursion is circumscribed just to the Emilia-Romagna sector of the Po River Delta (from a geomorphological point of view, the oldest in the whole Po River Delta complex), skipping the Veneto sector, for the reason of organizational necessities and the Emilia-Romagna sector being the only area directly and spatially linked to the International Conference hosting institution, the University of Bologna.

The approach underneath the trip is strictly connected, of course, to field

work, considered as an irreplaceable element in geographic research.

The historical evolution of the Po River Delta

Unlike the Eastern Adriatic shorelines, the Emilia-Romagna Coastal Zone is characterized by very straight and regular sandy beaches (130 km approx. in length), mainly due to the alluvia of the Po River, the largest Italian watercourse (hydrographical basin surface: 70,000 km²; 4 millions m³/year of solid transport approx.). This coastline, located on the border between the Mediterranean bio-geographical region to the South and the Continental one to the North, has to be considered a Quaternary coastal area due to sedimentation processes, while *rias*, cliffs or rocky coastal landforms are absent.

The final part of the Po River course, that its Delta, is characterized by very fast evolutive trends, which altered deeply the local landscape and the hydrographic network in the last centuries.

Once the last glacial period (Würm, 10,000 years BP approx.) and the subsequent Holocene marine transgression finished, the Po River Delta experienced an evolution mainly driven by climatic and anthropogenic factors.

A long tradition of interdisciplinary studies have been carried out here since the 19th century (LOMBARDINI 1869): an integrated approach involving paleochannels, high river beds, dunes-bars, archaeological investigations and, for recent times, toponymy and historical cartography, made possible a general reconstruction of the complicated evolution of the Po River Delta in the last 3000 years (fig. 1) (CIABATTI 1967; VEGGIANI 1985; BONDESAN 1990; CIABATTI 1990; BONDESAN 2000; SIMEONI 2004).

During the 10th century BC, lower Po River forked into two main arms, the so-called “Po d’Adria” to the North and “Po di Spina” to the South, while the coastline should be located 10 km approx. inland in comparison with present-day situation. Between Proto-history and Roman Age, sedimentation processes made the shores lengthen towards the Adriatic Sea and the “Po di Spina” arm became the main river branch: such an affirmation is based on the settlement of the homonymous Etruscan town of Spina on it. On the contrary, in this period the role of “Po d’Adria” underwent a drastic regression. Skipping many centuries, in the year 1000 AD approx., the Po River course may have flowed South of the city of Ferrara, divided in two branches (“Po di Volano” to the North and “Po di Primaro” to the South). In the middle of the 12th century AD, lower Po hydrographic network experienced a drastic change, as the result of a catastrophic collapse of the banks and subsequent flood known as “Rotta di Ficarolo”: during a climate deterioration period, Po River waters found a new way North of Ferrara city, originating a new branch re-named “Po delle Fornaci” or “Po Grande” (literally “Kilns Po” and “Large Po”, respectively). In the following centuries, this new arm became the most important of all, while Po Southern arms (“Po di Volano”, “Po di Primaro”) began to decline.

The last step of this long-term evolution occurred between 16th and 17th centuries, when the coastline was coincident with the present one. In this period the Po River started an increase of its mouth complex, forming the nowadays lobate-shaped peninsula, located in the Veneto region, lengthening towards the Adriatic Sea. Such a fast sedimentation process was inset by an artificial hydraulic work, known as “Taglio di Porto Viro” (1604),

promoted by Venice in order to prevent Venice lagoon straits silting up, caused by Po River alluvia (TCHAPRASSIAN 2004).

On the basis of this diachronic perspective, it arises clearly that Veneto sector of the Po River Delta is currently the active one, while the Emilia-Romagna part has to be considered as the “fossil one”.

Wetlands, very common in Ferrara Province until some decades ago before the land reclamations program, in this region are known as “*valli*”/sing. “*valle*” (from Latin “*vallum*”, “wall”, in this case probably a dune-bar), or “*campi*” (literally “fields”): they have to be explained as semi-enclosed brackish water bodies, fed by the Apennines rivers fresh water inflow and partially in communication with the sea, due to subsidence phenomenon operating on Po River senescent arms and deltaic lakes.

From a wetland to an agricultural zone: the development of land reclamations in the Emilia-Romagna sector of the Po River Delta (second half of the 19th-’70s of the 20th century)

Land reclamations hold a long tradition in Italian lowlands, plains and mouth systems, since the proto-historical period (e.g. the Etruscans in Italy) to the Contemporary Age, passing through Roman, Medieval and Modern Times.

Such large and expensive infrastructural works, strengthened by technological progress in the last 150 years, were usually related to the aim of agricultural development, as an attempt, in a malthusian view of the process, to mitigate fast demographical growth.

At least three land reclamations methodologies have occurred in Italy through the centuries.

The first one is land reclamation through

gravity force. This approach, consisting of “opening a gate” to the waters and letting them flow downstream, is quite rare, because most of the deltaic plains in Italy are partially located in depressions below the sea level: under these conditions land reclamation through gravity is impossible. The most famous case in Italy of such a kind of land reclamation is the Fucino one (Abruzzo Region, started during the Roman Times, but ended only in the second half of the 19th century), located not in a coastal plain but in an Apennines-surrounded one.

A second methodology is usually called “hydraulic land reclamation”: wetlands and lowlands could be filled-up thanks to rivers alluvia, transported there on the basis of a river anthropic diversion. Such a system requires just a few works (fluvial diversions, banks construction to canalize the sediments, etc.), but it runs only in a very long period (decades, sometimes centuries, depending from rivers solid transport). This approach was frequently used during Medieval and Modern Times in the Po Plain in general and in the Po Delta wetlands in particular, until the middle of the 19th century. The most important hydraulic land reclamation project in the Emilia-Romagna Region was the “Lamone land reclamation”, in Ravenna district (7000 hectares; 1840-1950 approx.), described by Swiss scholar Friedrich Vöchting, in the ‘20s of the 20th century, as *«impressive»* (VÖCHTING 1927).

The last land reclamation method, also in a chronological perspective, is related to dewatering pumps (so-called “mechanical land reclamation”), and it began in the Po River Delta during the second half of the 19th century. Waters were sucked up from depressed areas by pumps (at first powered by steam, then oil, finally electricity), raising their level and then letting them flow to the sea by gravity.

In the Emilia-Romagna sector of the Po Delta, during Contemporary Age, Governments and private investors promoted a drainage of deltaic wetlands, at first through hydraulic works, afterwards through dewatering pumps (ISENBURG 1971).

Reclamations reached their peak during the Fascist Age (‘20s-‘30s of the 20th century), in the framework of the so-called “*Bonifica Integrale*” (literally “total land reclamation”) and during the Agrarian Reform (‘50s of the 20th century; A. De Gasperi government). This is significant: Ideology and Politics always influenced land-reclamations; the political dimension of such projects was to create approval towards the government among farmers and field-hands, beneficiaries of the new lands (ISENBURG 1981; CAZZOLA 2000; SALTINI 2005).

These works, which ended only at the beginning of the ‘70s, altered in a large scale the physiognomy of the territory.

Firstly, new lands (so-called “*Terre nuove*”) were organized with a regular and modular division of land (fig. 2), completely different from “historical” fields (so-called “*Terre vecchie*”), creating, in a very short time, a new agrarian landscape, here known as “*larghe*”/sing. “*larga*” (literally “large”). New settlements were founded and new rural houses were built using a standard model.

Nowadays, it is possible to state that the relation between costs and benefits was unsatisfying, and that this anachronistical program has largely failed: in the ‘60s of the 20th century, Italy had already become a secondary sector-pulled economy; the agriculture was no longer the most important economic sector in the country; emigration, country depopulation and urban concentration processes had already begun (CENCINI 1996, pp. 65-66; ZAGO 2003). Moreover, in the Emilia-Romagna



Fig. 2 – Modular division of lands in the “Valle del Mezzano” (Ferrara Province), reclaimed between the ‘50s and the ‘60s of the 20th century. Underneath the fields, paleochannels are recognizable. Satellite image. *Source:* Google Earth.

sector of the Po Delta, further evidences of land-reclamations failure is linked to the fact that in some parts, large estates of land have now re-appeared (field-hands and fishermen, beneficiaries of reclaimed areas, have re-sold the lands to large estate holders), and to soil salinization processes, which are presently reducing the agricultural yield.

Unfortunately, under this program, the wetlands surface decreased drastically and important natural values (firstly, Biodiversity) were lost: in 50 years (‘20s-‘70s of the 20th century), the Emilia-Romagna wetlands surface decreased by 60-70% (fig. 3) (DONATI 1984; IVALDI 2004).

Present-day economic and management issues

Until the first half of the 20th century, the Po River Delta, both in Emilia-Romagna and Veneto Regions, was one of the most underdeveloped zone in Northern Italy, characterized by high rates in unemployment, social decay, illegality and low incomes.

Currently, isolation and social problems have been mitigated, but the situation of Comacchio area (South of Ferrara and reclaimed zones chief town) is still problematic: urban population has decreased in the last decades; today industry is underdeveloped.

Since the ‘60s-‘70s, Sun & Sea tourist development on Ferrara coastline meant a significant step forward for local system

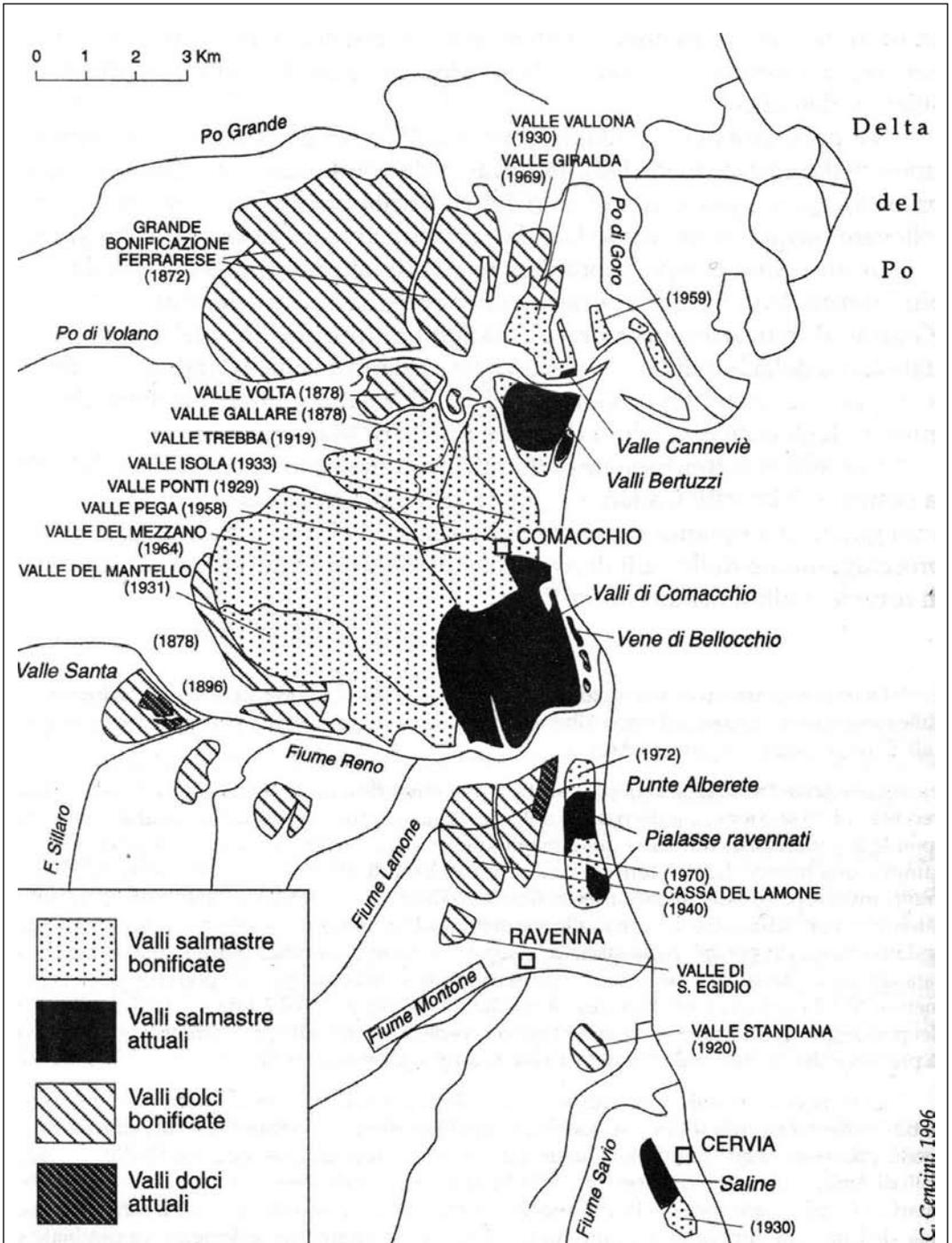


Fig. 3 – The evolution of land reclamations in the Emilia-Romagna sector of the Po River Delta between 19th and 20th century. Dotted spaces indicate brackish wetlands, currently reclaimed; black ones indicate brackish wetlands still existing; single oblique lines indicate fresh water wetlands, currently reclaimed; black oblique lines indicate fresh water wetlands still existing. The dates emphasize, for each “valle”, the year during which land reclamation work was finished. *Source*: CENCINI 1996.

(MENEGATTI 1979; GALVANI 1987), but, skipping building speculations in newly urbanized coastal areas, Comacchio city was only slightly involved in this process. Nowadays, a perspective for local, sustainable development is linked to the Emilia-Romagna Po River Delta Regional Park, which has its direction office located in Comacchio city. This protected area, founded in 1988 and included since 2000 in UNESCO World Heritage list, could contribute to develop eco- and agri-tourism. In particular, birdwatching holds great potential, because the Po River Delta is one of the largest European wetlands, together with Volga and Danube ones and Camargue.

Unfortunately, until now, such a perspective has been locked or checked by the Po River Delta fragmentation into two separated regional parks, one in the Emilia-Romagna Region and another one in the Veneto Region, the last founded in 1997. This fact caused a gap in relation with management policies and practices; more than 20 and 10 years after the creation of these protected areas respectively, the limits of this division arose.

Inside the scientific community and, less so, on the regional political level, the desire is to re-think the model, and to adopt, in the case of the Emilia-Romagna and Veneto Regions, a new inter-regional strategy to manage the Po River Delta as a whole, both from the point of view of natural conservation and tourism resources exploitation.

Turning two separated regional parks into one national park, seems to be the best option in the near future.

Field Trip Itinerary

After the preliminary stage from Bologna South to Romagna Region by the A14

highway, the excursion starts next the town of Bagnacavallo (Ravenna Province), with the first stop located along the “Naviglio Zanelli”.

After this, it is planned to go some kms North West as far as Alfonsine; from here, turning right, the road crosses the Reno River (former Po di Primaro River), leaving the Romagna Region and entering in Ferrara Province and the Emilia Region.

The first settlement on our way is Anita, a village founded during the Fascist Era. Once out of Anita, the field trip continues on to “Argine di Agosta”, one of the most evocative places in Comacchio wetlands. A short deviation on the left is related to land reclamations in “Valle del Mezzano”, one of the largest of all. The next stop concerns land reclamations in “Valle Pega”, reaching finally “Stazione Foce”, where a short boat trip in residual wetlands is going to take place.

The excursion finishes at Comacchio city, with a walk in the historical centre (fig. 4).

Stop no. 1. Naviglio Zanelli artificial channel (18th century) (Bagnacavallo Municipality)

In Romagna Region, watercourses present small hydrographical basins, irregular régimes and low water volumes: this is the reason why none of them is currently navigable. Such a problem promoted debates and hydraulic projects through out the centuries, in order to solve this situation and unlock this territory to commerce.

The first idea to open a new waterway, linking the city of Faenza, located in Romagna plain, at that time part of the Papal State, to the Adriatic Sea, dates to 1682: Pietro Maria Cavina (1641 approx.-1691) proposed to increase the water vol-

Fig. 4 – *Man-Waters Interactions in the Po River Delta – Emilia-Romagna Sector field trip* (May 14th, 2010). White line indicates the itinerary; numbers indicate the stops. Cartography: ISTITUTO GEOGRAFICO DE AGOSTINI 1995.

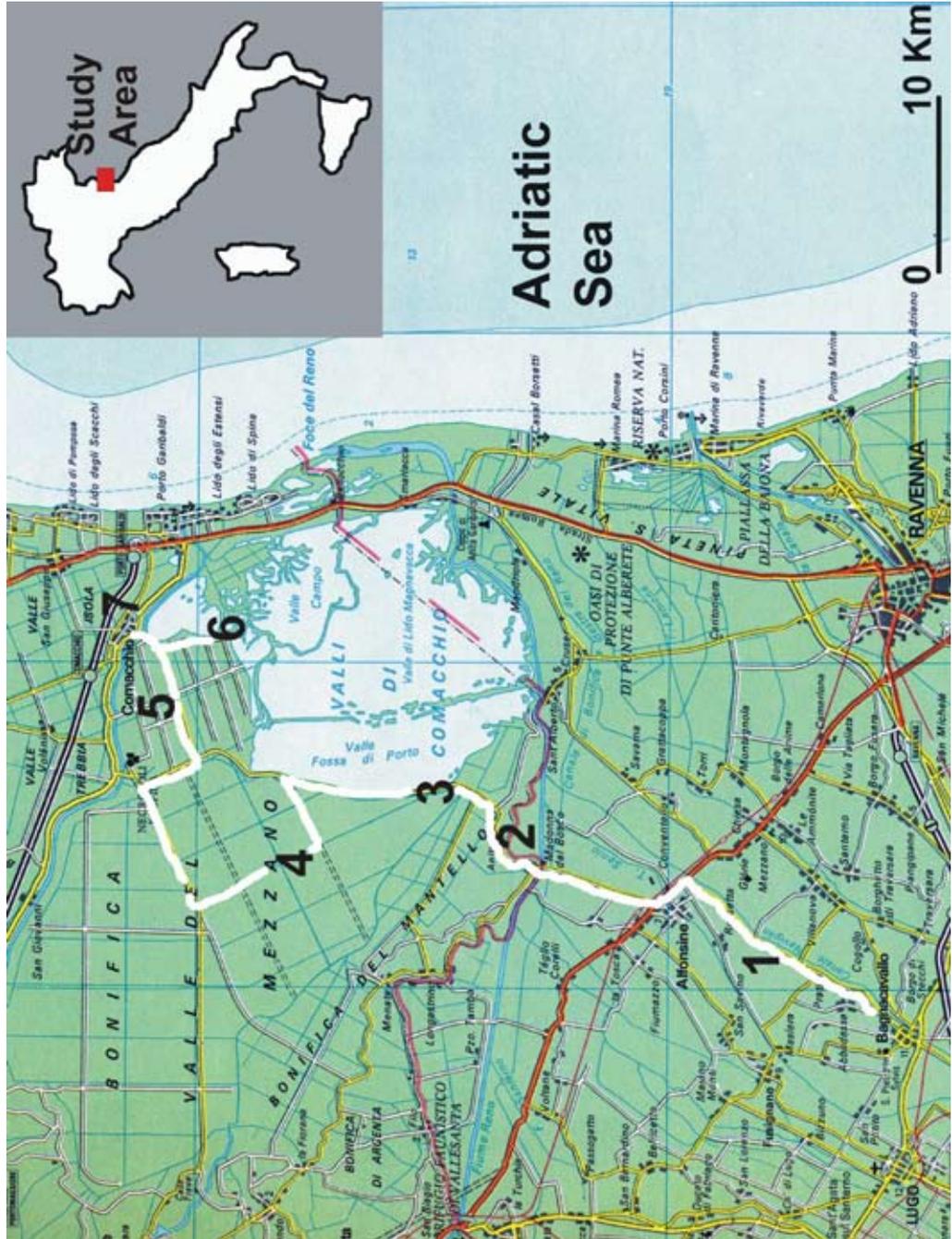




Fig. 5 – *Aque, Fiumi, e Scoli principali della Romagna* by Pietro Maria Cavina (1678). North is on the top, but diverted to the West by 44 degrees. This was the first project, in Romagna Region, concerning a new navigable channel linking Faenza to the Adriatic Sea. On the map, the channel is emphasized in blue. *Source*: PIASTRA 2009.

ume of the “Via Cupa” stream, flowing between the Lamone River to the West and the Montone River to the East, and make it navigable (fig. 5) (PIASTRA 2009). This project, characterized by high investments in a crisis period like 17th century in Italy, was never put in practice.

One century later approx., Scipione Zanelli, a Lord from Faenza, re-considered this conjecture, giving the scholar Romualdo Bertaglia, from Ferrara, the duty to draft a new program (1754). Bertaglia supposed a new artificial navigable channel (fig. 6), fed by the Lamone River waters, passing on the left of Lamone course and being conveyed, on the lower section, as a right tributary of “Po di Primaro”, a Po River Southern senescent arm (currently Reno River) (BRAGGION, TOCCI 1972; TOCCI

1977). After several years of discussions, Scipione Zanelli, thanks also to his relationship with the Pope of that time, Pius 6th (they were cousins), had the papal approval to such a work. The hydraulic infrastructure, sponsored with Zanelli’s private funds, was finished in just 6 years, and it was inaugurated on May 29th, 1782, with the presence of the Pope. But Zanelli promoted a speculative approach in newly opened channel management, putting taxes on water commerce and hampering private navigation, in the effort to re-gain his investments. Because of this, navigation declined through the decades, and ended completely during the second half of the 19th century, turning this waterway into a mills channel. In the 20th century “Naviglio Zanelli” was converted into an



Fig. 6 – *Pianta Topografica Demostrativa della situazione della Città di Faenza, e del luogo progettato per condurre un Canale Navigabile dalla Città suddetta al Mare Adriatico, mediante il Po di Primaro (...)*, by Romualdo Bertaglia (1754). This project was adopted by Scipione Zanelli, a Lord from Faenza, to dig Naviglio Zanelli channel from Faenza to Po di Primaro River. The new navigable channel (in red on the map) was inaugurated on May 29th, 1782.



Fig. 7 – Present-day image of Naviglio Zanelli channel near Bagnacavallo (Ravenna Province). The navigation stopped in the second half of 19th century, and the channel was converted to provide energy for mills. Currently, it is used as an irrigation channel. *Photo*: S. Piastra, 2010.

irrigation channel (fig. 7).

Currently, some environmental restoration projects connected to it are in progress, with the aim to re-consider this rural landscape element as historical-cultural evidence.

Stop no. 2. The “double face” of Anita (Argenta Municipality): Fascist Era reclamation-related new settlement, present-day Communist and Post-Communist toponymy

During the Fascist Era (1922-1943), land reclamations, on the basis also of an ideological perspective, reached their *acme*.

In Ferrara Province, during this period, a mechanical drainage of “Valle Umana” wetland, South of Comacchio and East of Argenta, was promoted. Here, in newly reclaimed area, besides new fields, a new settlement, called “Anita”, was founded in 1939 (PENAZZI 2007; PENNACCHI 2008, p. 289, n. 46), just one year before Fascist Italy came into the Second World War. Such a toponym (a female first name) refers, with celebrative and nationalistic aims, to Anita Garibaldi, the wife of the Italian *Risorgimento* famous hero Giuseppe Garibaldi: she died in this zone in 1849 while escaping, together with her husband, from Austrian and Papal armies.

The village presents a Fascist-styled urbanism, with orthogonal quarters (fig. 8); the church, the school and the Fascist Party Section (fig. 9) are located facing the central square, as an ideological *manifesto* of the urban body.

Currently, Anita is an isolated, semi-deserted village, and, as a sort of a retaliation, shows a Communist and Post-Communist ideological re-appropriation of urban spaces, contrary to the original one, related to the social conditions of field-hands who were the first to settle here: in

fact, the square is dedicated to pro-freedom victims; secondary roads to Second World War communist partisans.

Stop no. 3. Fascist Era rural houses, Umana dewatering pump and Argine di Agosta, “The road on the water”

Once out of Anita, agrarian landscape is characterized by large, straight and regular fields, here known as “*larghe*”. In connection with a right-angle bend in the road, an exemplificative Fascist Age reclamations-related standard rural house is visible (fig. 10): the layout is regular; the only building materials are bricks; on the façade, an epigraph celebrates the assignment date to the farmer (1939).

Going straight, a huge historical land reclamation plant is visible on the left: it is “Umana” dewatering pump, dating to the ‘30s, still today in operation (fig. 11). Originally, dewatering pumps were fed through steam, then oil, finally electricity. The next stop is “Argine di Agosta” (literally “Bank of Agosta”), on the top of which the road runs: it has to be interpreted as a Proto-historical dune-bar, some meters in relief, once dividing “Valle Fossa di Porto” wetland to the East and “Valle del Mezzano” wetland (currently reclaimed) to the West. The toponym “Agosta” refers to the latin “*Fossa Augusta*”, a semi-artificial channel dating to the Imperial Roman Age, linking the port of Ravenna to the Po River Southern arms of that time, which are currently filled up.

Francesco Serantini (1889-1978), a local writer from Castelbolognese (Ravenna Province), dedicated a story to this evocative place, entitled *La strada sull’acqua* (literally “The road on the water”), dating to the ‘60s: «(...) *This is argine di Agosta! Yes, it is, a finger made of earth located in the water,*



Fig. 8 – Satellite image of Anita village (Argenta Municipality, Ferrara Province). The village was founded in 1939. It presents a Fascist-styled urbanism, with orthogonal quarters; current urban toponymy denotes a Communist and Post-Communist ideological re-appropriation of urban spaces. Satellite image. *Source:* Google Earth.



Fig. 9 – Anita: Fascist Party Section, recently recovered for public uses. *Photo:* S. Piastra, 2010.



Fig. 10 – Neighbourhood of Anita: a Fascist Age reclamation-related standard rural house is visible. On the façade, an epigraph celebrates the assignment date to the farmer (1939). *Photo: S. Piastra, 2010.*



Fig. 11 – Neighbourhood of Anita: “Umana” dewatering pump, dating to the ‘30s. *Photo: S. Piastra, 2010.*

today it is a road, a sort of dream. (...) it is a beautiful road, miles and miles in the middle of the waters, in the silence of wetlands, in the solemnity of wetlands, in the mystery of the wetlands; the man who planned this road has to be a magician or a poet» (SERANTINI 2003, pp. 109-110).

Stop no. 4. “Valle del Mezzano” land reclamation (‘50s-‘60s of the 20th century): landscape and economic issues

Once a bridge on the left is passed, our itinerary enters the “Valle del Mezzano”, the largest wetland complex in Comacchio area (20,000 hectares approx.), reclaimed between 1957 and the late ‘60s, by the *Ente Delta Padano* (EDP) (literally “Po River Delta Authority”), afterwards renamed *Ente Regionale Sviluppo Agricolo* (ERSA) (literally “Agriculture Development Regional Authority”), a body which had to manage land reclamations in this period (fig. 12).

This land reclamation, carried out through dewatering pumps (Fosse and Lepri plants), was one of the latest in the region. Its present rural landscape is characterized by a very regular modular division of land; agriculture here is highly mechanized; new rural settlements are very rare (fig. 13).

Such a land reclamation, programmed in the attempt, under a political view, to turn definitively Comacchio fish-poachers (so-called “*fiocinini*”, word linked to their fishing tool, *it. “fiocina*”, “harpoon”: see also par. no. 7) into farmers, can probably be considered the most exemplificative case of failure of the land reclamation program: in the ‘60s, agriculture was no more the main Italian economic sector; assignees have re-sold their fields, and large estates of land have re-appeared (GALVANI 1999, pp. 51-52); because of soil saliniza-

tion processes and extreme organic component of soil (fig. 14), agriculture yield is decreasing.

In conclusion, costs-benefits relation was/is inefficient, and the land reclamation caused a decline of natural values.

Such a negative balance was shared, in an emotive way, by Francesco Serantini, who dealt with such a theme in several stories, for example, in *Addio alle valli*, (literally “Farewell to wetlands”) (‘60s): «(...) *I went to give the last farewell to “Valle del Mezzano”, it does not exist anymore because they drained it. (...) I saw you as a dead woman’s body. Your surface is still here as far as the horizon, but it is no more a majesty of light blue water, it is a desert of rusty grass, a desert without life and soul. I saw no more birds on you (...). And they were your colour, your beauty, your breath, your way to be alive»* (SERANTINI 2003, pp. 191-193).

The same in *La strada sull’acqua*, previously quoted: «(...) *the black and deserted earth is waiting, the roads are ready, who is this land waiting for? Does it know that men don’t want to be farmers anymore?»* (SERANTINI 2003, p. 110).

Concerning “Valle del Mezzano” land reclamation, similar elegiac impressions are also present in Francesco Fuschini’s works (1914-2006), another local writer from Argenta (Ferrara Province). In a story entitled *Un paese perduto* (literally “A lost village”), dating to the ‘70s, these are Fuschini’s considerations: «[In the “Valle del Mezzano” just reclaimed] *you can see only watermelons (...) and you can hear the strident echo of bulldozers, which are creating new fields in reclaimed lands. Concerning the original savage environment of Comacchio wetlands, I found nothing except for a postcard»* (FUSCHINI 2007, p. 120).

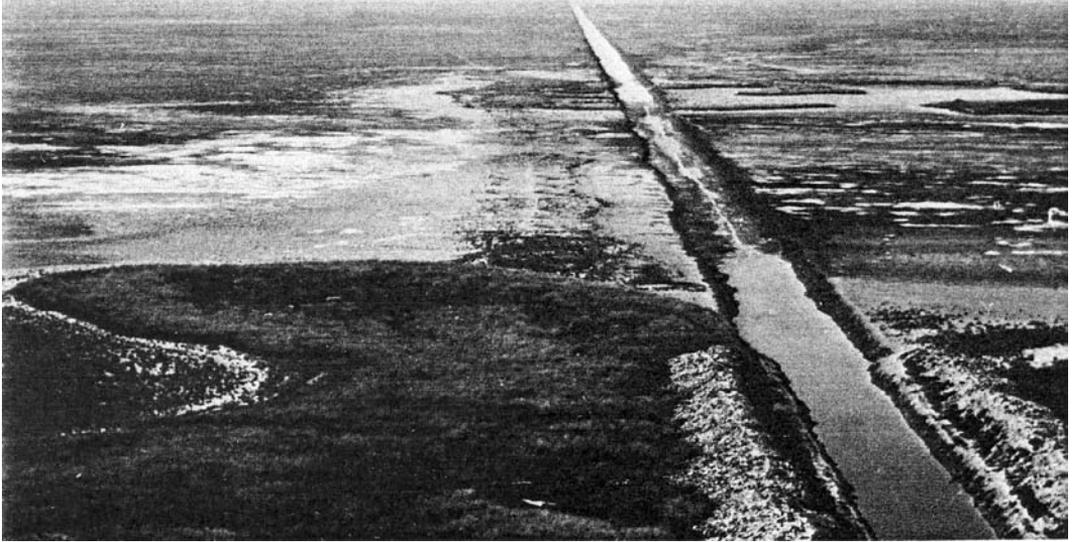


Fig. 12 – Reclamation works in “Valle del Mezzano” (Ferrara Province). Photo dating to the ‘50s of the 20th century (ERSA Archive). *Source*: CAMPI 1989.



Fig. 13 – Present-day highly mechanized agriculture in reclaimed “Valle del Mezzano”. *Photo*: S. Piastra, 2010.

Stop no. 5. “Valle Pega” land reclamation (‘50s of the 20th century): reclamation-related standard-rural houses, nationalistic new toponymy, archaeological investigations in reclaimed areas

Once out of “Valle del Mezzano” land reclamation, the field trip enters “Valle Pega” land reclamation, reclaimed in the ‘50s, just a few years before the “Valle del Mezzano”, in the framework of Italian Agrarian Reform promoted by Italian Prime Minister Alcide De Gasperi. Differently from “Valle del Mezzano”, reclamations-related modular rural houses are visible here (fig. 15); the toponymy presents nationalistic and ideological implications, referring to former Italian territories (Istria peninsula) passed to Yugoslavia after the Second World War, in the attempt, in a theoretical and over-ambitious approach, to claim them and keep their memory among the people (fig. 16). Another scientific issue related to the Po River Delta wetlands reclamation program regards archaeological findings: waters drainage and channel excavations brought to light several archaeological complexes, dating to the Iron Age (Etruscan settlement of Spina, with respective *necropoleis*), the Roman Age (several country *villas* and also a well-preserved commercial ship) and the Middle Ages (BERTI 1990; UGGERI 2006).

During “Valle Pega” reclamation, besides an Etruscan necropolis related to Spina, an Early-Medieval church, *S. Maria in Padovetere*, was investigated (fig. 17) (CORTI 2007): the toponym “*in Padovetere*” refers to the church’s original location along a Po River senescent arm.

Stop no. 6. Stazione Foce: a boat trip in Comacchio residual wetlands

Once arrived to “Stazione Foce”, Emilia-Romagna Po River Delta Regional Park visitor centre, the excursion is going to start a round boat trip in Comacchio residual wetlands. We will reach, by boat, traditional, seasonal houses, currently converted to educative purposes, located in sand islands (locally known as “*bari*”/sing. “*baro*”) in the middle of the “*valli*”: in this area, these houses are known as “*casone?*”/sing. “*casone*” (literally “big houses”). Two different types of “*casone?*” are visible here: fishing ones (so-called “*casone da pesca*”) (fig. 18) and guard ones (so-called “*casone da guardia*”, with the aim to prevent illegal fishing, which was once under public or semi-public monopoly, in the wetlands) (fig. 19). Moreover, eel fishing traditional structures, known as “*lavorieri?*”/sing. “*lavoriero*”, have been rebuilt (fig. 20).

During the boat trip, it is possible to analyse Comacchio wetlands landscape: clay- and flat-bottomed brackish water bodies, just 1-2 meters deep, very rich in ichthyofauna, without any permanent human settlements.

These residual wetlands were saved from the land reclamation program thanks to a proposal, dating to 1965, by the *Ente Delta Padano* (DAGRADI 1979, p. 39): in fact, at that time, both scientific community and public opinion, fully aware about the unsolved problems of reclamation, were largely adverse to the total fulfilment of the land reclamation project.

Stop no. 7. Comacchio city: social and urban themes

From Stazione Foce, the field trip goes on as far as Comacchio.

Since the Early Medieval Age, the city of



Fig. 14 – “Valle del Mezzano” reclamation. The photo emphasizes salinization and the extreme organic component of the soil: this is the reason why agriculture yield here is low. *Photo*: S. Piastra, 2010.



Fig. 15 – Modular division of land and reclamations-related standard rural houses in “Valle Pega” (Comacchio, Ferrara Province), reclaimed in the ‘50s of the 20th century. Satellite image. *Source*: Google Earth.



Fig. 16 – Nationalistic and ideological toponymy in reclaimed “Valle Pega”, referring to former Italian territories (Istria peninsula) passed to Yugoslavia after the Second World War: the attempt, in a theoretical and over-ambitious approach, was to claim them and keep their memory among the people. In the picture, a road dedicated to Pula (currently located in Croatia), *it.* Pola. *Photo:* S. Piastra, 2010.



Fig. 17 – Archaeological investigations in reclaimed “Valle Pega” (‘60s of the 20th century): the Early-Medieval church of *S. Maria in Padovetere*, originally located along a Po River senescent arm. *Source:* BERSELLI 1977.



Fig. 18 – A traditional fishing house in the middle of Comacchio residual wetlands. Photo: S. Piastra, 2009.

Comacchio had a bipolar economy, based on one side on salt production and commerce in the Po Plain (CECCHINI 1997); on the other on fishing and aquaculture, in particular eels (*Anguilla anguilla*). The local people's semi-scientific approach to eels aquaculture impressed, for example, French scholar Jean-Jacques Coste, who visited Comacchio wetlands in the middle of the 19th century, and dealt with such a topic in full detail in his works (COSTE 1855).

During the Modern Age, commercial fishing in brackish waters became a public or public-related monopoly (at that time, the Papal State), and the social body of Comacchio, isolated from the rest of the country, underwent a dichotomic split: State-salaried wetlands fishermen (“*val-lant?*”) and guards (“*guardiavall?*”) VS. fish

poachers (“*fiocinini?*”). Such a situation continued until the Contemporary Age, when the public monopoly of commercial fishing passed to a municipal company called “*Azienda Vall?*” (“wetlands company”), finally renamed “SIVALCO”, and brought permanent conflicts in the urban space of Comacchio, where the whole of the population was settled. This process influenced indirectly also anthropological and social behaviours: for example, for a “*fiocinino?*”, social consideration grew in proportion with the number of his arrests or months passed in jail; during a “*fiocinino?*” detention, fishing companions were used to support his family (CERNUSCHI SALKOFF 1981). This conflicting condition was further worsened by fast demographical increase.

Such a peculiar social contraposition in-



Fig. 19 – A traditional guard house along “Argine di Agosta”: its aim was to prevent illegal fishing. *Photo:* S. Piastra, 2009.



Fig. 20 – An eel fishing traditional structure, known as “*lavoriero*”. *Photo:* S. Piastra, 2009.



Fig. 21 – A present-day image of Comacchio: because of the land reclamation program, carried out during the 20th century, it is currently surrounded by fields. *Photo*: S. Piastra, 2010.

side a small urban space, inspired several novels: e.g. *Il paese dell'acqua brulicante. I fiocinini* (literally “The village of swarming water. The fish poachers”) by Arturo Malagù (MALAGÙ 1967), or *Al mare lontano* (literally “To the far-away sea”) by Massimo Vaggi (VAGGI 2005).

After the Second World War, land reclamations and industrialization broke the isolation of Comacchio, now surrounded by fields (fig. 21); at the same time, emigration and depopulation phenomena were inset.

Concerning the urban landscape, Comacchio is very similar, in a smaller scale, to Venice: urban morphology is influenced by channels (MAESTRI 1977; DALLARI 1979) (fig. 22), in the past used also for internal navigation; the historical core of the city is just for pedestrians, and bridges link the channels banks (fig. 23). Fishing-

related Industrial Archaeology plants have been restored, and converted to eco-tourism and environmental education centres (fig. 24).

Currently, in Comacchio wetlands eels fishing is still practised, but in a sustainable way; Comacchio salt-pan underwent recently an environmental restoration, becoming a new site for birdwatching (PORTANOVA [no date]).



Fig. 22 – The urban landscape of Comacchio, similar to Venice. *Photo:* S. Piastra, 2010.



Fig. 23 – The most impressive monument in Comacchio: Trepponti bridge (literally “The three bridges”), 17th century. *Photo:* S. Piastra, 2010.



Fig. 24 – Eel-related Industrial Archaeology plant (“*Manifattura dei marinati?*”) in Comacchio, recently converted to an eco-tourism and environmental education centre under the umbrella of the Emilia-Romagna Po River Delta Regional Park. *Photo:* S. Piastra, 2010.

Cartographical Appendix:
landscape evolution in the
Emilia-Romagna sector
of the Po River Delta
from historical and contemporary maps
(19th-20th centuries)



Section of a map concerning Ferrara Province, drafted by Austrian Imperial Army Geographical Institute (1814). Original scale 1:15,000 approx.; North is on the top. The city of Comacchio is represented as an island in the middle of the wetlands. *Source*: PIZZOLI, VENTURI 1987.



Comacchio wetlands (Northern Italy): North of Comacchio, “Valle Isola” has not been reclaimed yet. Italian Army Geographical Institute map (IGM 77, Comacchio), dating to 1934. Original scale 1:100,000. From types of Istituto Geografico Militare (licence no. 6568, March 16th, 2010).

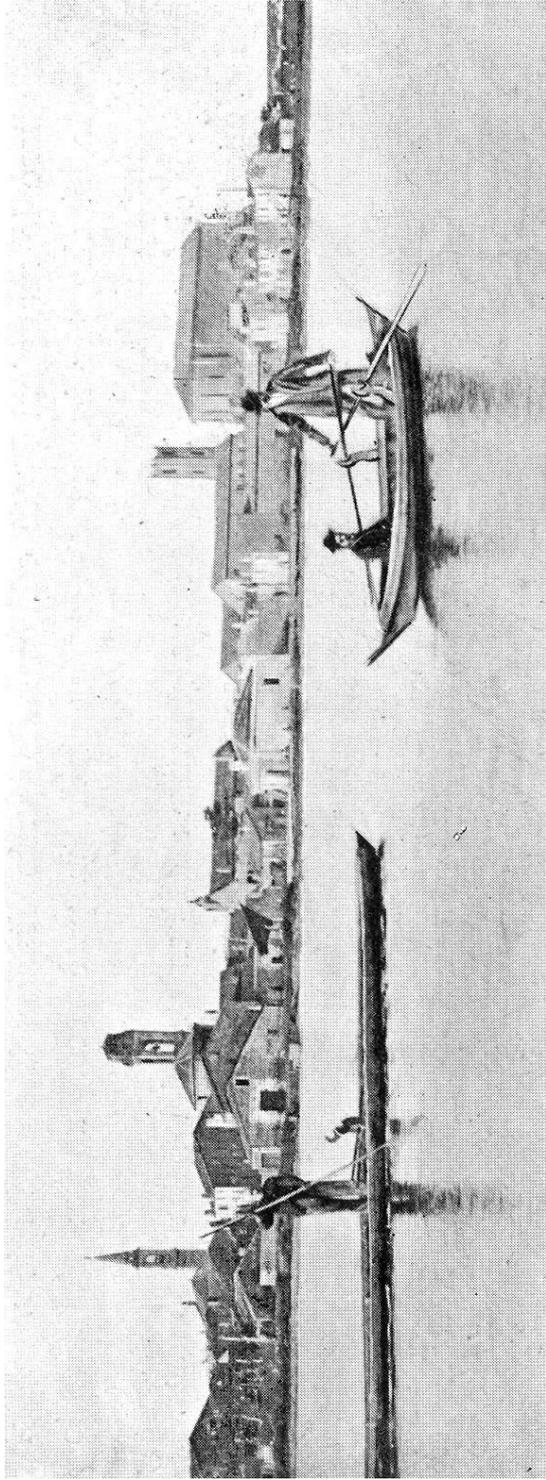


Comacchio area: “Valle del Mezzano” (to the West), “Valle Rillo” and “Valle Pega” (South-West of Comacchio) have been completely reclaimed. On the coastline, to the East, several Sun & Sea seasonal tourist villages have been settled; North of Porto Garibaldi, artificial cliffs have been built to mitigate coastal erosion. Italian Army Geographical Institute map (new version) (IGM 205, Comacchio), dating to 1985. Original scale 1:50,000. From types of Istituto Geografico Militare (licence no. 6568, March 16th, 2010).

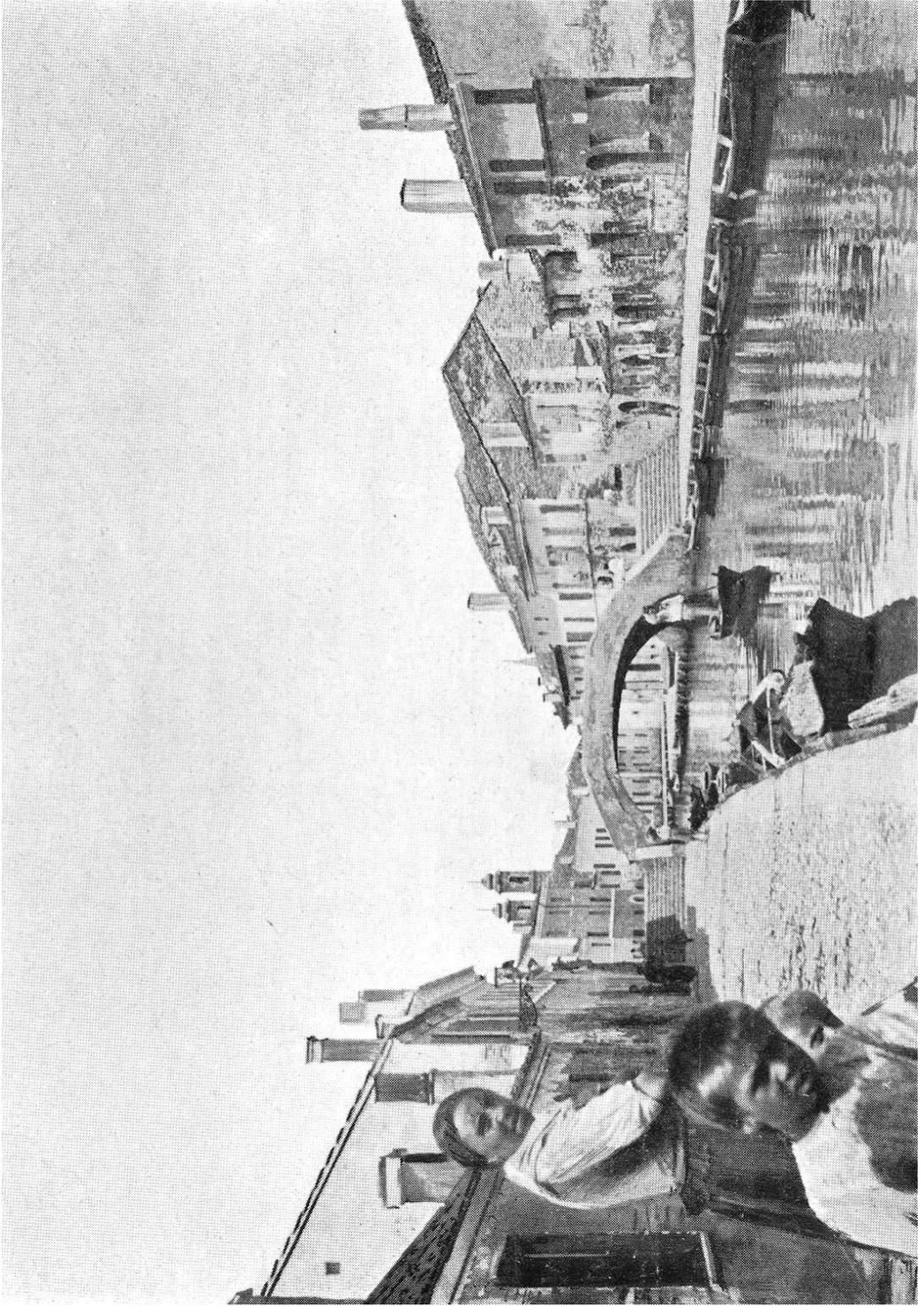


Present-day image of Comacchio zone: residual wetlands and reclaimed ones. *Source:* Google Earth.

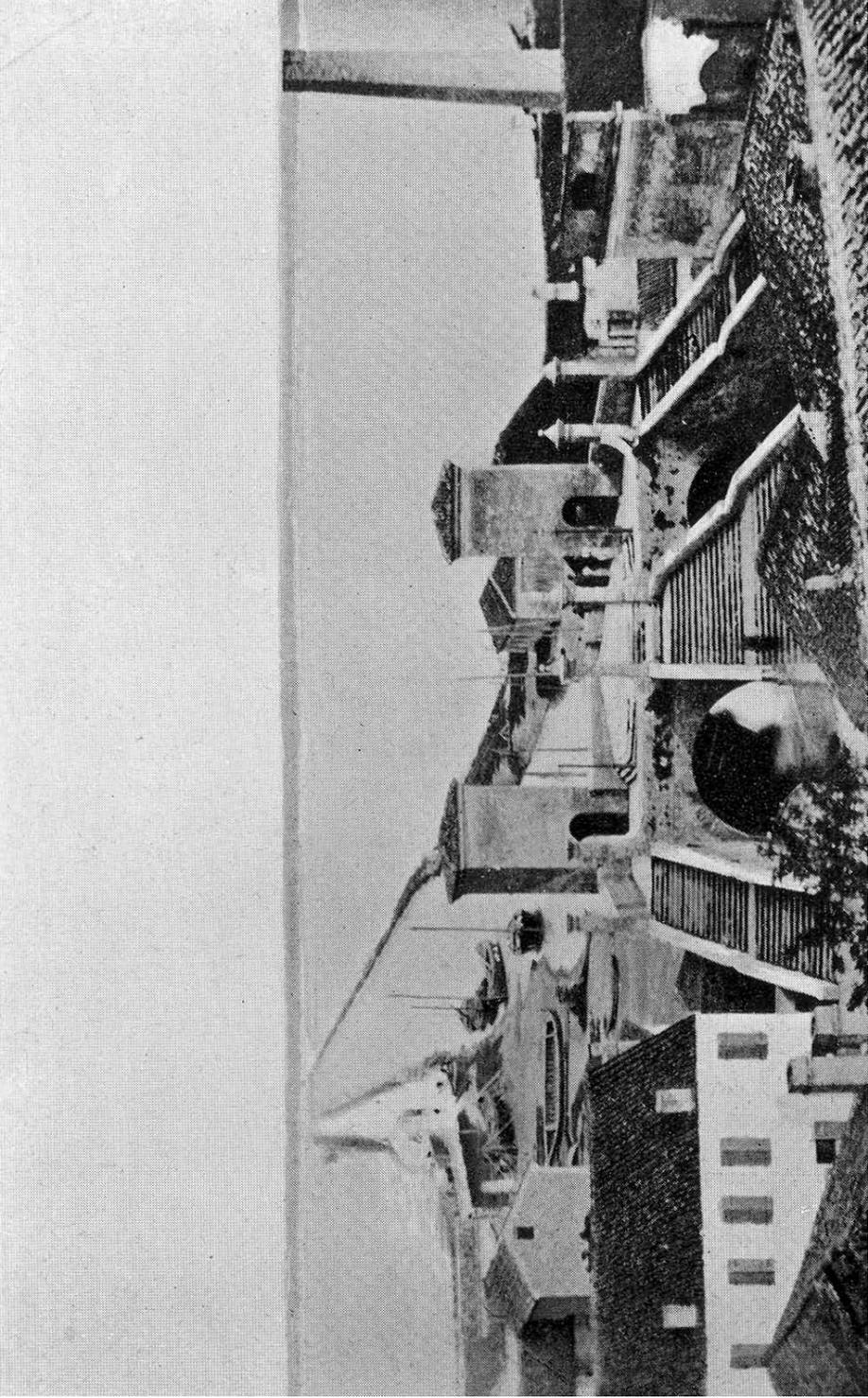
Photographical Appendix:
the people and the city of Comacchio at
the beginning of the 20th century



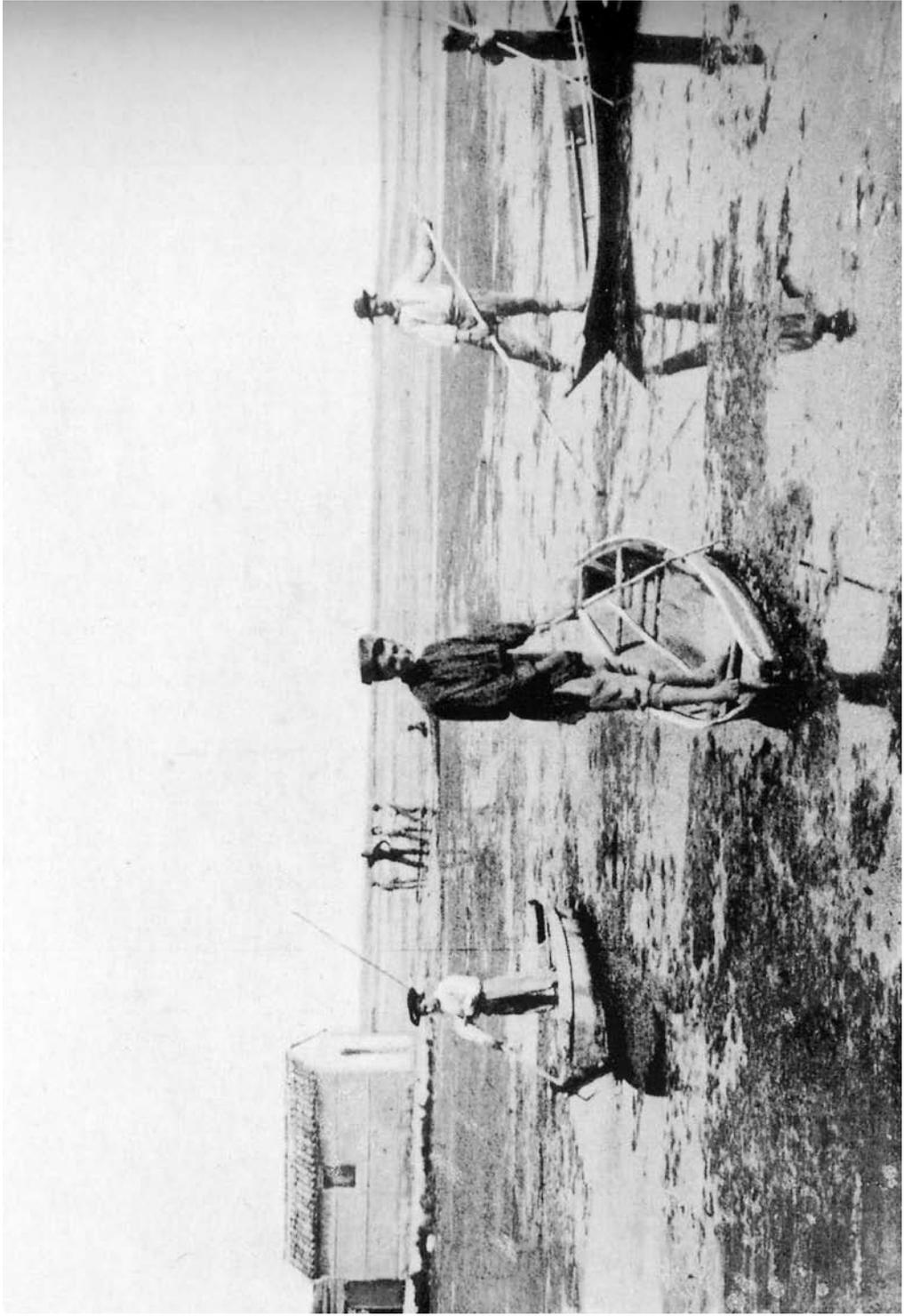
Comacchio, surrounded by waters, at the beginning of the 20th century. *Source:* BELTRAMELLI 1905.



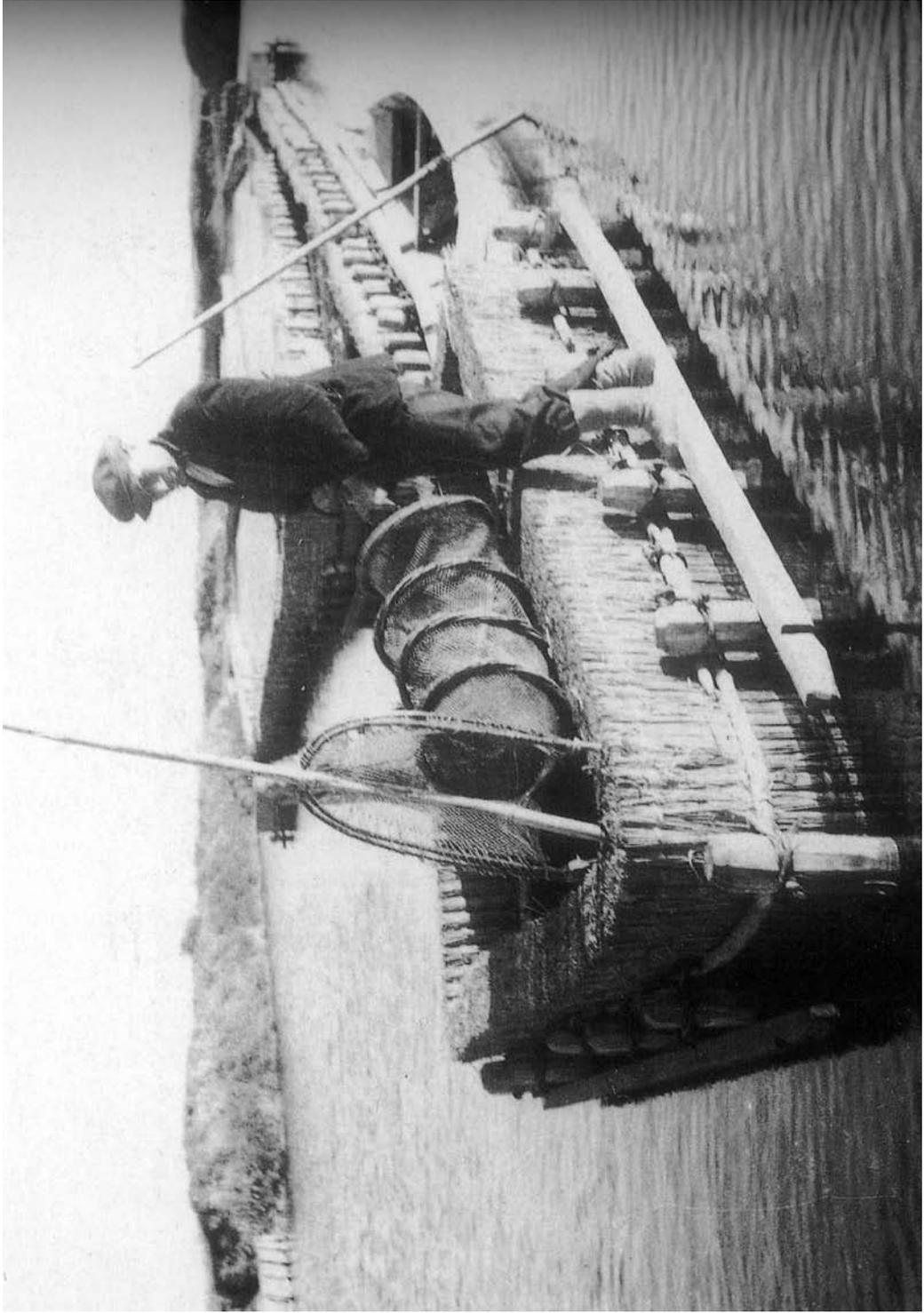
An urban channel in Comacchio. Beginning of the 20th century. *Source:* BELTRAMELLI 1905.



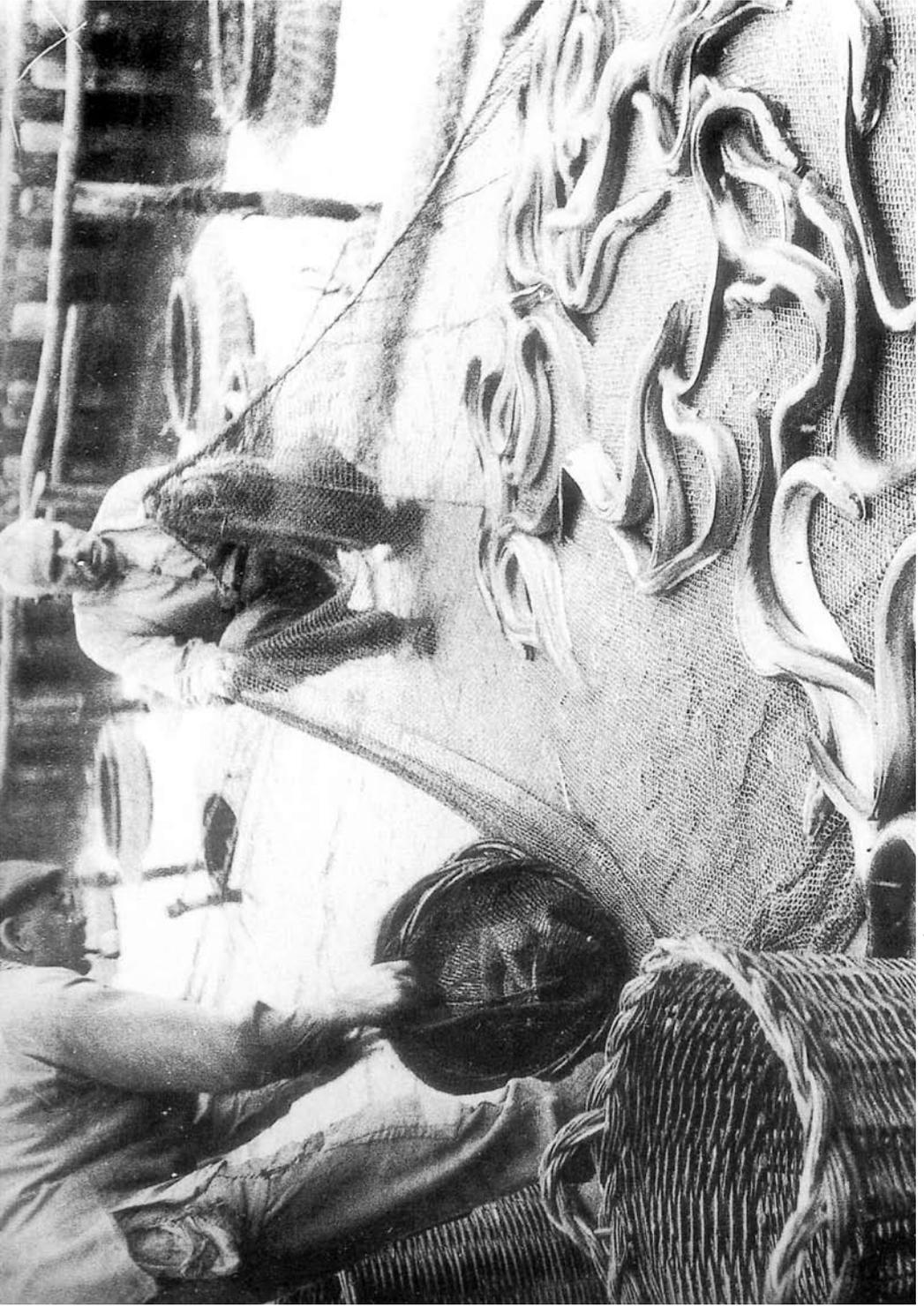
“Treponti” bridge in Comacchio. Beginning of the 20th century. *Source:* BELTRAMELLI 1905.



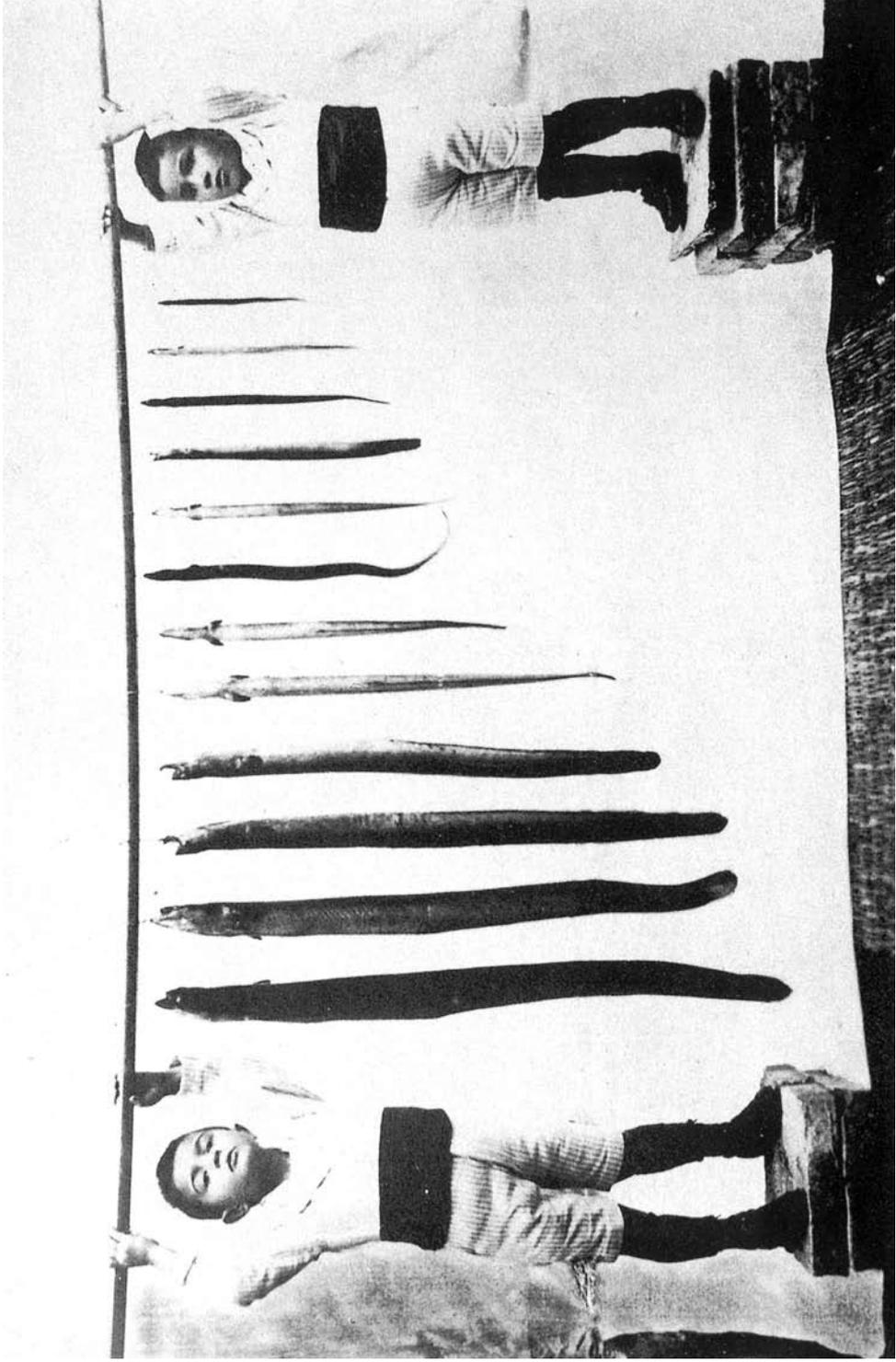
“Fiocchini” in Comacchio wetlands at the beginning of the 20th century. *Source:* CECCHINI 1990.



Eels fishing in a "lanoriero". Comacchio wetlands; beginning of the 20th century. Source: CECCHINI 1990.



Eels out of the net. Beginning of the 20th century. *Source: CECCHINI 1990.*



Kids showing eels of different age and weight. Comacchio. Beginning of the 20th century. *Souire*: CECCHINI 1990.

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Printed in Italy

April 2010

Carta Bianca Publishing House
Faenza (Ravenna)