Discussion Session 6.2 / Séance de Discussion 6.2

Coastal and marine engineering

Génie côtier et travaux maritimes

(Flood in Maduroland©)

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ABSTRACT: The discussion session on coastal and marine engineering, the last one of the XVth ICSMGE at Istanbul, was organized in a completely different setting. A risk and management game, titled Flood in Maduroland, was played and the public, divided into different parties, shared the decision making process with dedication and enthusiasm. It amused the audience and became a learning experience for those who participated.

RÉSUMÉ: La séance de discussion au sujet des ingénieries côtière et marine, la dernière de la XV^{ème} conférence du ICSMGE à Istanbul, a été organisée dans un cadre complèment différent du reste. Un jeu de risque et de gestion intitulé 'Inondation au Maduroland' y a été proposé et le public, divisé en différents groupes, a partagé le processus de prise de décision avec dévouement et enthousiasme. Cela a amusé l'auditoire et est devenu un processus d'apprentissage pour ceux et celles qui y ont participé.

1 PREMISE

The Organizing Committee of the XVth ICSMGE considers discussion sessions a most important opportunity where participants can express their views and learn something of their own interest through lively communication. For the final discussion session, devoted to coastal and marine engineering, this consideration has been carried out to the letter. After consultation with the theme lecturer Suzanne Lacasse (Norway), the session chairman Boleslaw Mazurkiewicz (Poland), and the panelists Eduardo Alonso (Spain), Shinji Sassa (replacing Hideo Sekiguchi, Japan), Jean-Bernard Kovarik (France), and Ramon Verdugo (Chile), the discussion leader Frans Barends (Netherlands) and session secretary Maarten de Groot (Netherlands) decided to play a risk and management game which involves the panelists and the audience in an active and educative atmosphere. This game, titled Flood in Maduroland, has been created by Frans Barends for the occasion of the 65th anniversary of GeoDelft in 1999, and it has been played since with full contentment.

2 FLOOD IN MADUROLAND

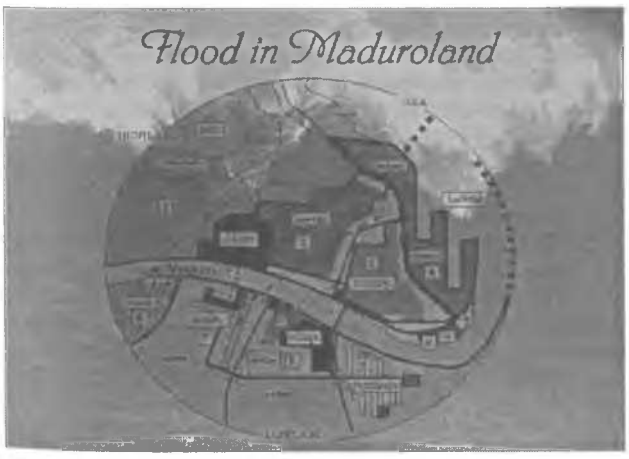
The risk and management game Flood in Maduroland takes the public into the fictional country Maduroland where the people live prosperously and peacefully. The game is played in five stages

1. INTRO introduction and explanation of the situation;
2. START investment in safety, economy or nature;
3. RUN threat, improvement in water defense system;
4. SPRINT inundation, selection of rescue scenario;
5. END overview of the result and the process.

Game leader Han Vrijling (Netherlands) controlled the process and a management team of six spokesmen (actors) prepared and took decisions every stage with the support of the public which was divided into six parties, each upholding its specific interests.

public party	*actor*	*interests*
government	Mazurkiewicz	safety, energy, water defense
civilians	Kovarik[1]	education, housing, work, city
farmers	Sassa	village, diary & food products
industrials	Alonso	industry, harbor, airport
investors	Verdugo	auction, high-tech park, marina
environmentalists	Lacasse[2]	landscape, monuments, recreation

replaced by [1]Frits van Tol and [2]Andre Koelewijn (Netherlands)



The weatherman/journalist Frans Barends provided information, the board of specialists by Michael Heijbaum (Germany) and Meindert Van (Netherlands) answered any questions asked during the decision making, and Rami Barends (Netherlands) organized the play board (computer support) visualizing promptly the actual status, i.e. consequences of decisions on Maduroland.

beach	university	old city	industry	harbor
forest hill park	road gates	city quay wall	industry dike	marina
landscape	retention basin	breakwaters	villa dike	villa area
high tech park	tunnel doors	old sluice dike	green house dike	green houses
energy supply	airport	village	auction hall	cattle

3 RISK AND MANAGEMENT

Maduroland is a lowland small country situated along the sea and crossed by the river Maduro (see the map). Last decades many investments have contributed to the present wealth of the country. A large industrial area, a harbor complex, and a semi-international airport support the economy and employment. Maduro City offers tourists an attraction by its monuments in the old center and a famous university. Living is convenient in new city quarters, with recreation in the forest hill park and the nearby beach. The agricultural sector is successful in diary and greenhouse products. Plans exist for a new fruit and vegetable auction hall, for a small marina in the river mouth, and for a high tech park in the retention basin upstream. Climate changes are said to cause increasingly higher water levels that may threaten to inundate Maduroland and jeopardize the infrastructure. The harbor area is protected by large breakwaters, but they are not suited for predicted sea level rise. Most of the primary river dikes are improved to actual safety norms, but these norms do not comply well with the reality of today. Some protection works are particularly vulnerable: the old city quay walls, and the old sluice. The land is divided by secondary dikes into so-called hydrological units. At some places these dikes are breached for road passage. High river levels can be retarded by the retention basin upstream. The river storage capacity became limited by a luxurious villa quarter, built in the river-pit, in the river bedding. Recently intensive rains abroad, where the Maduro originates, are reported, and a spring tide is predicted. The weather forecast is unfavorable. A management team is installed that will take the necessary measures to protect Maduroland.

Sinji Sassa gives an interview to journalist Frans Barends

4 PLAY

After an introduction of the situation (1st stage), investments were chosen (2d stage) to either preserve safety against inundation, either improve the natural environment, or promote the economy. The public parties and their spokesmen supported their own interests. After a dynamic public discussion each party chose one improvement out of a selection of possibilities. The farmers were overwhelmed by party member Holger Netzel (Germany) to repair the old sluice in order to prevent future problems. Such decisions affected the status of Maduroland with respect to safety, nature and economy. Their consequences could only be guessed!

The weatherman ringing the bell announced bad conditions are coming. High water is to be expected. All parties have unanimously to agree upon at least two out of ten improvements of water defense structures, each having specific positive and/or negative effects (3d stage). A vivid debate – in the government party Lothar Martak (Austria) was actively advocating his view, in the environment party the improvement of the breakwaters, suggested by industrials and investors, was resolutely rejected – an intensive communication and a thorough inquiry with the board of specialists lead, just in time, to a democratic decision. But, after all, was Maduroland really safe?

Unfortunately, the situation became exceptionally worse. The forecast turned out to become a disaster. Massive evacuation was inevitable, but the time was too short. The parties had to decide to breach one dike and inundate the hinterland, as to save the remainder of Maduroland from a catastrophe (4th stage). A hot debate arose on whose property is to be sacrificed. Minimizing damage on account of the party of the farmers was furiously denied by their spokesman Sinji Sassa (see photograph). Compensation offered by the representative of the industrials, Eduardo Alonso, and of the investors, Ramon Verdugo, were not convincing. Roland Gärber (Switzerland) came with a valuable proposition. Yet, voting was necessary, decided the game leader. So, there were winners and losers.

Finally, a complete disaster was avoided (5th stage) and the status (play board) showed the final result concerning the functioning of the facilities of Maduroland. It showed that the damage was minor, as a result of the fact that in the 2d stage most investments were done in safety measures. "It could have been very different.", the game leader Han Vrijling summarized, "But, you see, you are engineers, after all. How it will be in real life?"

Rami Barends showed the secrets of the play board

5 REVIEW

About 100 participants enjoyed this game in the prestigious Marmara Hall with a special outfit designed by Maarten de Groot to create the perfect ambiance. The audience learned how difficult it is to apply personal experience and expertise in a (fictional) life situation, disputing and committing with other interests. As such this risk and management game complied well with the general statements of theme lecturer Suzanne Lacasse, to wit, the role of technique is changing in the world of today; as situations become more complex by functional integration and public intervention the engineer needs more than before speak the language of others, be flexible to changes, seek for integrated opportunities, and promote proudly that his profession is of crucial importance at the intersection of society and environment. The game showed once again that the best learning is achieved by self-doing. I remember particularly the remark by Ramon Verdugo, spokesman of the investors, at the end: "How one gets influenced and enchanted by his specific interest during the course of the game! I am surprised." As discussion leader I was pleased by the active participation of so many in the audience. This risk and management game, a rather unconventional way to hold a scientific discussion, reached its goal. "A session that will be remembered." stated Boreslaw Mazurkiewicz in his closing words.