

## Nebraska Delegation Visit to Bahia

*Assessment of Water Potential in Western Bahia: Quantifying and Monitoring Availability of the Urucuia Aquifer and Surface Water in the Grande, Corrente and Carinhanha River Basins*

BAHIA, BRAZIL. 02/26 to 03/03/2018

### OVERVIEW

The Nebraska delegation visit to Bahia sought to contribute to the improvement of water resources management in western Bahia. The successful experiences and challenges of water management for irrigated agriculture in Nebraska and Bahia were presented and discussed among technicians, researchers, farmers, water user representatives, civil society, policymakers (executive, legislative, and judiciary) and the media. The program included several meetings, farm tours, two international seminars and an audience with the Governor of the State of Bahia, Mr. Rui Costa. About 300 professionals, representing 111 organizations from different sectors, participated actively in the activities and interacted with the Nebraska delegation. Representing the Daugherty Water for Food Institute at the University of Nebraska (DWF / UNL) were its directors, Dr. Peter McCornick, Dr. Christopher Neale and Dr. Nicholas Brozovic and researchers and extension professors Dr. Troy Gilmore and Dr. Daran Rudnick. The delegation also included the Assistant Director of the Nebraska Department of Natural Resources (DNR), Mr. Jesse Bradley; the General Manager of the Upper Republican Natural Resources District (URNRD), Mr. Jasper Fanning; and the farmer Jerry Stahr of York, Nebraska. More than 20 media outlets, including the major television networks and newspapers in Salvador, the capitol of the state of Bahia state, and western Bahia broadcasted and published news on the presentations and meetings.



*Western Bahia, in red above; Bahia state of Brazil, in red in bottom left corner*

The actions were part of the program “Study of the Water Potential of the Western Bahia,” financed by the Program for the Development of Agriculture (PRODEAGRO). The projects are implemented by researchers from the Federal University of Viçosa (UFV) and the Federal University of Rio de Janeiro (UFRJ) in partnership with the Bahia Farmers and Irrigators Association (AIBA), the Daugherty Water for Food Institute at the University of Nebraska (DWF / UNL), and the Government of the State of Bahia through multiple Secretariats. These Secretariats include Secretariat of Agriculture, Irrigation, Livestock, Fisheries and Aquaculture (SEAGRI), State Secretariat of Environment (SEMA), Secretariat of Water Infrastructure and Sanitation (SIHS) and the Institute for Environment and Water Resources (INEMA). An additional program, “Water, Food and Energy Security in the Western Bahia” was also presented. This program encompasses the same partners listed above and is financed by the National Board of Scientific and Technological Development (CNPq). The associated applied research projects and their preliminary results were discussed at technical meetings between researchers and specialists from Brazilian academic institutions (UFV, UFRJ, UNEB and UFOB), the University of Nebraska (DFWI / UNL), technicians from public institutions and state organizations, (SEMA, INEMA, SEAGRI and SIRHS), the Federal Government (CPRM and CODEVASF) and the State of Nebraska (DNR and URNRD).

Considering the importance of governance in this area, a technical meeting occurred with representatives from the Basin Committees of the Grande (CBHG) and São Francisco (CBHSF) Rivers. The participants discussed the relevance of the study and the prospects of additional projects within the watersheds. There were also two meetings with the Public Ministry of the State of Bahia, where participants discussed water resources and the importance of scientific research, with emphasis on environmental legislation. In the two International Seminars, speakers from UFV, DWFI / UNL and the State Government of Bahia presented 22 lectures and provided opportunity for questions and comments from participants in all water sectors. At the meeting with Governor Rui Costa, with the presence of the Secretaries of State for Agriculture, Environment and Water Infrastructure (SEAGRI, SEMA and SHIS), the ongoing projects and activities of the Water for Food Institute at the University of Nebraska (DWFI / UNL) were presented. The participants highlighted the activities of the study of water potential and the importance of water and food security in both large scale and family agriculture during the conversation with the Governor. The participants visited a large-scale grain farm in the "cerrado" region and small-scale family farms in the "valley" region. The Nebraska Delegation also had the chance to visit a Conservation Unit (Permanent Conservation Area APP) in the Rio de Janeiro River Basin. The group also visited facilities of the Paulo Mizote Experimental Farm of the AIBA Institute. All visits allowed the Nebraska delegation and researchers involved in the projects to discuss the challenges and opportunities of sustainable use of water and natural resources for food production. The ongoing projects and activities carried out during the visit of the Nebraska delegation were presented to the participants of the "Passarela da Soja" event, sponsored by the Fundação Bahia and the Embrapa. The results of the projects will be discussed at an event at UFV, scheduled for the end of 2018.

## PROPOSED PROJECTS

As a result of the delegation visit, the following projects are proposed:

1. **Modeling and Monitoring Systems for Water Resources (surface and groundwater) in Western Bahia.** The integration of INEMA's initiatives in the monitoring area with the ongoing projects was discussed with Mr. Eduardo Topázio (INEMA Water Director), who scheduled a visit to the UFV in the coming weeks. The joint work will also involve DWFI in a partnership between these institutions.
2. **Water Resources Governance Models for Western Bahia.** AIBA, DWFI and UFV will attend the 8th World Water Forum in Brasilia, where the ongoing projects and future possibilities could be presented and discussed in a global water context. A post-doctorate working at DWFI/UNL has already distributed questionnaires to water users and interest groups regarding the governance of water resources in western Bahia. This study is based on a similar evaluation carried out in Nebraska and will serve as a basis for the discussion and proposal of governance models in a future research project in the area of public policies.
3. **Leadership Capacity Building for Water Management:** Based on the demands of institutions and organizations in the region, the research team and the AIBA Institute discussed the structure of a training course on water management. The course is expected to begin in the second half of 2018 and will include professors from UFV, UFRJ, UFOB, UNEB, FASB, University of Nebraska and AIBA specialists. Participants will work in teams, focusing on the most relevant regional and local challenges for the sustainable management of water resources.
4. **Development Projects for Irrigated Family Farming in the "Vale" Region of western Bahia.** The importance of projects for smallholder family farming was highlighted during visits,

meetings and seminars, and especially during the audience with the Governor of the State of Bahia, Mr. Costa. Two projects for western Bahia will be proposed:

- a) The implementation of a shared central pivot irrigation system, based on the DWFI experience in Africa. The political support for this project was reinforced by Mr. Osiel Oliveira, Mayor of Luís Eduardo Magalhães;
- b) Taking advantage of the structure and initiatives of the AIBA Institute and its Experimental Farm, a project will be proposed for irrigated agriculture involving young entrepreneurs. The projects will seek to take advantage of the vast experience of UFV in rural extension and family agriculture and the international experiences of DWFI in rural entrepreneurship.

## SUMMARY OF DELEGATION EVENTS

Seventeen distinct events occurred as part of the Nebraska delegation visit to Bahia from February 26 to March 3, 2018. Description of the events conducted during the visit are included below.

### **1) CLOSED WORKSHOP: GOVERNANCE AND INFRASTRUCTURE OF WATER RESOURCES AND IRRIGATED AGRICULTURE IN THE STATE OF BAHIA**

MONDAY, 02/26/2018 9:00 AM

**Venue:** *Auditório da SEAGRI. 4ª Avenida Centro Administrativo da Bahia (CAB) Salvador - BA, CEP 41745-002. Brazil.*

**Activities:** Researchers from UFV, UFRJ, UNEB, University of Nebraska and specialists from the Secretariats of the State of Bahia (SEAGRI, SEMA, INEMA and SIHS) presented the situation and the programs implemented in Bahia. The Secretaries of State Mr. Victor Bonfim and Mr. José Geraldo Reis and Director General of INEMA, Ms. Márcia Telles attended the workshop.



**Participants:** Nebraska delegation, project researchers, AIBA / ABAPA leaders and technicians, President of SPRLEM and leaders and technicians of the Government of Bahia.

### **2) FIRST MEETING WITH THE PUBLIC MINISTRY OF THE STATE OF BAHIA**

MONDAY, 02/26/2018, 11:00 AM

**Venue:** *Ministério Público do Estado da Bahia. 5ª Avenida Centro Administrativo da Bahia (CAB), Salvador - BA, CEP 41745-004. Brazil.*

**Activities:** Meeting with the Attorney General of Justice Exma. Mrs. Ediene Lousado, Attorney General of Justice, Exmas Sras. Cristina Seixas and Luciana Khoury and the Technical Advisor Eng. Zuri Pessoa. The participants presented the project and discussed issues related to water use in agriculture in the western Bahia and the experience of Nebraska.



**Participants:** Mr. Celestino Zanella (AIBA), Mr. Júlio Busato (ABAPA), Bahia State Deputy Mr. Eduardo Salles, Dr. Christopher Neale (DWF / UNL), Prof. Everardo Mantovani, Prof. Aziz Galvão (UFV/DWFI-UNL) and Ms. Catiane Magalhães (AIBA).

### **3) INTERNATIONAL SEMINAR: SCIENTIFIC RESEARCH FOR PUBLIC POLICIES ON SUSTAINABLE MANAGEMENT OF WATER RESOURCES: Examples from Nebraska, USA and western Bahia, Brazil**

MONDAY, 02/26/2018, 02:00 PM

**Venue:** *Sala das Comissões. Assembleia Legislativa do Estado da Bahia. 1ª Avenida, 130 - Centro Administrativo da Bahia (CAB), Salvador - BA, CEP 41745-001. Brazil.*

**Activities:** Around 120 participants attended the seminar, which focused on the importance of scientific research for the formulation of public policies for water and food security. After sessions, the participants had the opportunity to ask questions and discuss with the speakers.



The themes of the presentations are described below.

OPENING: Government of the State of Bahia, AIBA, UFV, DWFI

Moderator: Secretary Mr. Vitor Bonfim.

Sr. Vitor Bonfim, Secretary of SEAGRI,

Sra. Márcia Telles, General Director of INEMA and Mr. Eduardo Topázio, Water Director of INEMA

Dr. Peter McCornick, Executive Director of DWFI/UNL

Mr. Celestino Zanella, President of AIBA,

Prof. Everardo Mantovani, UFV AIBA/PRODEAGRO-UFV agreement coordinator.

Opening Presentation: [Water for Food Security](#)

Dr. Peter McCornick, Executive Director of DWFI/UNL



SESSION 1: Water Resources Governance:

Moderator: Prof. Aziz Galvão (DER-UFV/DWFI)

Lessons in Groundwater Governance from the American West

Dr. Nicholas Brozovic, Policy Director of DFWI/UNL

Water Resources and Management within Nebraska

Mr. Jesse Bradley, DNR-NE Assistant Director

Natural Resources Districts

Mr. Jasper Fanning, URNRD General Manager

Water Resources Governance in the State of Bahia

Mrs. Márcia Telles, General Director INEMA

SESSION 2: Research, Water Resources Management and Irrigated Agriculture.

Moderator: Prof. Aziz Galvão (DER-UFV/DWFI)

Research for Water and Food Security: Use of Technology for Small and Large-Scale Agriculture

Dr. Christopher Neale, Research Director of DFWI/UNL

Potential of Irrigated Agriculture in the Western Bahia

Prof. Everardo Mantovani, DEA-UFV

Urucuia Project: Groundwater Assessment and Modelling

Profs. Eduardo Marques, DEC-UFV and Gerson Silva, DGP-UFRJ.

Urucuia Project: Surface Water Assessment and Modelling

Prof. Fernando Pruski, DEA-UFV

Urucuia Project: Land use change and Food, Water and Energy Security

Marcos Heil Costa, DEA-UFV.

**Participants:** Nebraska delegation, project researchers, AIBA / ABAPA leaders and technicians, representatives of Farmers Unions, managers and technicians Government of Bahia Institutions. Representatives of the Executive, Legislative and Judicial Branches, NGOs, academics and media.

#### 4) TECHNICAL MEETING ON THE WESTERN BAHIA WATER RESOURCES ASSESSMENT

TUESDAY, 02/27/2018 9:00 AM

**Venue:** *Secretaria de Desenvolvimento Econômico*. 4ª Avenida, 415 - Centro Administrativo da Bahia (CAB), Salvador - BA, CEP 41745-002. Brazil

**Activities:** Technical meeting on the study of western Bahia water resources assessment. Representatives of AIBA, SPRLEM, Floryl Company (Mr. Per Knudsen and Mr. Alexandre de Salles) attended the meeting. Also present were institutions already conducting work in the region, including



CPRM (Mrs. Cristine Silva, Mr. Leonize Oliveira and Mr. Paulo Villar), CODEVASF (Sras., Priscila Martinez and Layse Gonçalves and Mr. George Carvalho), CREA-BA (Mrs. Gabriela Ataíde), and representatives of UFV, UFRJ, UCSAL (Prof. Hermes Barros). DFWI / UNL. Prof. Troy Gilmore (DFWI/UNL) presented

ongoing projects in Nebraska, which involved several organizations. Prof. Gerson da Silva reinforced the importance of interaction between institutions.

**Participants:** Prof. Gerson da Silva (UFRJ), Prof. Everardo Mantovani (UFV), Prof. Troy Gilmore (DWF/UNL), Dr. Alessandra Chaves and Eng. Glauciana Araújo (AIBA) and Ms. Carminha Missio (SPRLEM)

## 5) SECOND MEETING WITH THE PUBLIC MINISTRY OF THE STATE OF BAHIA

TUESDAY, 02/27/2018 1:00 PM

**Venue:** *Ministério Público do Estado da Bahia*. 5ª Avenida Centro Administrativo da Bahia (CAB), 750 - Centro Administrativo da Bahia (CAB), Salvador - BA, 41745-004.

**Activities:** The issues discussed at the previous meeting were deepened, including specific issues of interest to the western region and the Public Prosecutor's Office. The meeting was attended by the Attorney General of Justice Exmas Sras. Cristina Seixas and Luciana Khoury and Technical Advisor Eng. Zuri Pessoa. Additional information about the project was presented and discussed. Given that the Public Ministry has a support team with different technical backgrounds and experiences, Prof. Everardo Mantovani (UFV) proposed a technical exchange to discuss issues related to irrigation sustainability and water resources management. The proposal was supported by the representatives of Public Ministry and farmers.



**Participants:** Mr. Celestino Zanella (AIBA), Prof. Everardo Mantovani (UFV), Mrs. Carminha Missio (SPRLEM), Dr. Alessandra Chaves and Mrs. Catiane Magalhães (AIBA).

## 6) AUDIENCE WITH THE GOVERNOR OF THE STATE OF BAHIA, MR. RUI COSTA

TUESDAY, 02/27/2018 1:00 PM

**Venue:** *Governadoria do Estado da Bahia*. 3ª Avenida Centro Administrativo da Bahia (CAB), 390 - Sussuarana, Salvador - BA, CEP 41745-005.

**Activities:** Audience with the Governor of the State of Bahia, Mr. Rui Costa, with the presence of the Secretaries of State, Mr. Victor Bonfim (SEAGRI), José Geraldo Reis (SEMA) and Cássio Peixoto (SIHS). The ongoing projects (agreement AIBA/UFV) in



western Bahia and global activities developed by DWFI were presented. The Nebraska Department of Natural Resources and the Upper Republican Natural Resources District activities also presented their initiatives and projects. The continuity of the projects and the importance of family agriculture were discussed. The Governor highlighted the actions of the State in the area of water resources, among them the project "Water for All" and the results of initiatives involving family agriculture coordinated by the Department of Rural Development (SDR).



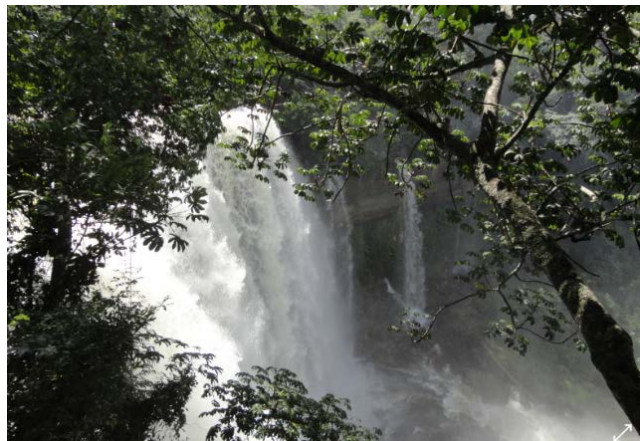
**Participants:** Nebraska delegation, project researchers, AIBA / ABAPA leaders and technicians, and LEM Farm Union President.

## 7) VISIT TO THE ENVIRONMENTAL PROTECTION AREA (APA) IN RIO DE JANEIRO RIVER BASIN

WEDNESDAY, 02/28/2018 2:00 PM

**Venue:** *Unidade de Conservação Área de Proteção Ambiental (APA) Bacia do Rio de Janeiro, Barreiras, BA. Brazil*

**Activities:** Visit to the Environmental Protection Area (APA) of the Rio de Janeiro River Basin. During the technical visit, the history and structure of the project were presented. The partnership between AIBA Institute, Solidarity Foundation, Sustainable Trade Initiative (IDH) and the State



Government (SEMA and INEMA) aimed to develop and implement a Management Plan for the APA Governing Council of the Rio de Janeiro Basin, established in 1993. The APA covers an area of approximately 351,000 hectares and encompasses the entire Rio de Janeiro Basin, an important tributary of the Rio Grande River. The Environment Director of AIBA highlighted the area's environmental, social and cultural importance to the region and mentioned that during project development different discussion forums were conducted in order to involve all local and regional interlocutors.

**Participants:** Nebraska delegation, project researchers, AIBA / ABAPA leaders and technicians, and LEM Farm Union President.



## 8) VISIT TO DECISÃO RIO BRANCO FARM

WEDNESDAY, 02/28/2018 3:00 PM

**Venue:** *Fazenda Decisão Rio Branco*. Rod. Anel da Soja, km 25 a esq. Estrada do Café, km 18 - Zona Rural, Barreiras - BA, CEP 47800-000. Brazil

**Activities:** Visit to Rio Branco farm. The farm's owner and management presented the management, storage infrastructure, agricultural mechanization, water extraction and distribution, irrigation equipment, cultivation fields and irrigation water control and monitoring systems (Irriger system). Legally required environmental preservation areas were also visited. The farm's directors presented and discussed data on the management and productivity of soy, maize, millet and cotton crops.



**Participants:** Nebraska delegation, project researchers, AIBA / ABAPA leaders and technicians, and LEM Farm Union President.

## 9) VISIT TO THE MARIINHA FARM IN IRRIGATED DISTRICT OF RIACHO GRANDE

THURSDAY, 03/01/2018 8:00 AM

**Venue:** *Fazenda Mariinha*. Estrada de Acesso à BR 135 - Zona Rural, Riachão das Neves - BA, CEP 47970-000. Brazil

**Activities:** Visit to Mariinha farm, owned by Mr. Josiel Menezes who works in the production of fruit, olive groves and banana seedlings. Mr. Cisino Lopes (AIBA Water and Irrigation Director), Mr. Aurélio Soares (NUPEBA / Riacho Grande Perimeter Manager) and Mr. Cícero Tavarez (Perimeter Manager Barreiras Norte) presented the history and structure of these Irrigation Districts controlled by CODEVAF. Next, Mr.



Josué Menezes presented the areas of irrigated production. The hydroponic, seedling and post-harvest production facilities were visited and productive procedures were presented and discussed. The property is a successful case of irrigation in family agriculture and the rational use of water resources in the production of fruit (banana and papaya) and vegetables using a hydroponic system. The property optimizes the use of productive resources by taking advantage of part of the by-products to feed animals (cattle, goats, sheep and fish) and organic residues for fertilization of the growing area. The



owner of this area is also a technology diffuser for neighboring producers and other irrigated perimeters.

**Participants:** Nebraska delegation, project researchers, AIBA / ABAPA leaders and technicians, and LEM Farm Union President.

#### 10) VISIT TO ENCANTO DAS FRUTAS FARM IN IRRIGATED DISTRICT OF RIACHO GRANDE

THURSDAY, 03/01/2018 10:00 AM

**Venue:** *Fazenda Encanto das Frutas*. Estrada de Acesso à BR 135 - Zona Rural, Riachão das Neves - BA, CEP 47970-000. Brazil

**Activities:** Visit to Fazenda Encanto das Frutas, which produces coconut and cocoa in the Riacho Grande Irrigated District. Mr. Aurélio Soares da Cunha (Executive Manager of Irrigated Perimeters Nupeba and Riacho Grande - DNR) accompanied the visit. The participants visited the post-harvest processing facilities and the coconut and cocoa production areas. The production



procedures utilized were also presented and discussed. The property is a pioneer in the implantation of the cocoa in western Bahia, with the goal of high-quality production destined for exportation. The potential of this crop in the region was discussed, especially the prospect of high productivity and lower risks of fungal diseases, such as the witch's broom (WBD).

**Participants:** Nebraska delegation, project researchers, AIBA / ABAPA leaders and technicians, and LEM Farm Union President.

#### 11) II INTERNATIONAL SEMINAR: SUSTAINABLE MANAGEMENT OF WATER RESOURCES IN IRRIGATED AGRICULTURE: Research, Policy, Rural Extension and Participation of Farmers from Nebraska, USA and Western Bahia, Brazil

THURSDAY, 03/01/2018 02:00PM

**Venue:** *Auditório da AIBA*. Av. Aylon Macedo, 919 - Morada Nobre, Barreiras - BA, 47810-035. Brazil

**Activities:** About 180 people attended the seminar, which focused on the sustainable management of water resources for irrigated agriculture and the importance of research, public policies, rural extension and farmer participation. The members of the Nebraska delegation presented experiences in Nebraska from the perspective of the main actors involved in the management of water resources in their state, such as the State Government, farmers, local society through Natural Resource Districts, research and rural extension.

After the presentations from the Nebraska delegation, the AIBA-UFV agreement projects were discussed and the partial results were presented. The Director of INEMA, Mr. Eduardo Topázio,

presented the actions of the state and highlighted the interaction and the expectation of expanding state government involvement in the work. The themes of the lectures are described below.



**OPENING: AIBA/ABAPA**

Moderator: Mr. Celestino Zanella, AIBA  
Dr. Peter McCornick, Executive Director of DWFI/UNL

Mr. Celestino Zanella, President of AIBA,  
Mr. Júlio Cezar Busato, President of ABAPA,  
Prof. Everardo Mantovani, UFV  
AIBA/PRODEAGRO-UFV agreement coordinator.

**Opening Presentation: Water for Food Security**

Dr. Peter McCornick, Executive Director of DWFI/UNL

**SESSION 1: Experiences of Water Resources Management and Irrigated Agriculture**

Moderator: Prof. Aziz Galvão, DER-UFV/DWFI

**Farming from My Perspective**

Jerry Staehr, Farmer, Nebraska

**Lessons in Groundwater Governance from the American West.**

Dr. Nicholas Brozovic, Policy Director DWFI/UNL

**Water Resources and Management within Nebraska**

Dr. Jesse Bradley, DNR-NE Assistant Director

**Natural Resources Districts**

Mr. Jasper Fanning, URNRD General Manager

**Potential of Irrigated Agriculture in Western Bahia**

Mr. Júlio Cezar Busato, President of ABAPA

**SESSION 2: Research and Extension in Nebraska**

Moderator: Prof. Aziz Galvão, UFV/DWFI

**Research for Water and Food Security: Use of Technology for Small and Large-Scale Agriculture**

Dr. Christopher Neale, Research Director of DWFI/UNL

**Nebraska's Conservation Survey Division and Groundwater Hydrology Research**

Prof. Troy Gilmore, Professor DWFI/UNL

**Extension and Irrigation in Nebraska**

Prof. Daran Rudnick, Extensionist DWFI/UNL

**SESSION 3: Project on Assessment of Water Resource in Western of Bahia**

Moderator: Prof. Everardo Mantovani (DEA-UFV)

**Urucuia Project: Groundwater Assessment and Modelling**

Profs. Eduardo Marques, DEC-UFV and Gerson Silva, DGP-UFRJ.

**Urucuia Project: Surface Water Assessment and Modeling**

Prof. Fernando Pruski, DEA-UFV

**Urucuia Project: Land use change and Food, Water and Energy Security**

Marcos Heil Costa, DEA-UFV (Presented by Prof. Everardo Mantovani)

**Participation:** Nebraska delegation, project researchers, AIBA / ABAPA leaders and technicians, representatives of rural unions and leaders and technicians of the Government of Bahia. Rural leaders, representatives of local and regional government (mayors, municipal secretaries, promoters, military police), NGOs, representatives of basin committees, academics and the media.

## 12) MEETING WITH THE RIO GRANDE AND SÃO FRANCISCO RIVER BASIN COMMITTEES

FRIDAY, 03/02/2018 07:00 AM

**Venue:** *Sala de reuniões AIBA/ABAPA*. Av. Aylon Macedo, 919 - Morada Nobre, Barreiras - BA, 47810-035. Brazil

**Activities:** Meeting with members of the Committees of the Rio Grande and Rio Grande Hydrographic Basins. The directors of the Rio Grande Basin Committee (CBHG), represented by President Elisa Zanella, and representatives of the São Francisco River Basin Committee (CBHSE) and the Regional Advisory Chamber of the São Francisco River (CCRMSF), presented the challenges faced by river basin committees. Prof. Almir Neto (Advisor for National and International Relations of UFOB), Mr. Saul Reis (Regional Coordinator of INEMA), Mr. Eduardo Topázio (INEMA Water Director) Mr. Demóstenes Júnior (Environment Secretary of the Municipality of Barreiras), Mr. Paulo Baqueiro (AEAB and member of CBHG), Mr. Cláudio Ápio (ACRIOESTE and member of CBHG) and Mr. Siderlon Lopes (representative of Civil Society and member of CBHG) participated in the discussion, where the importance of ongoing projects and the need for research on governance were highlighted. The participants accentuated the importance of the training of human resources.



**Participants:** Mr. Júlio Busato (ABAPA), Mr. Landino José Dutkiewicz (AIBA), Mr. Valter Gatto (AIBA), Mr. Hélio Hopp (AIBA), Mr. Armando Sá (AIBA), Dr. Alessandra Chaves (AIBA), Glauciana Araújo (AIBA), Dr. Helmuth Kiekhöfer (IABA), Dr. Christopher Neale (DWFII) and Profs. Everardo Mantovani and Aziz Galvão (UFV).



### 13) FINAL WORKSHOP: EVALUATION AND DISCUSSION OF POTENTIAL PROJECTS IN PARTNERSHIP WITH NEBRASKA

FRIDAY, 03/02/2018 09:00 AM

**Venue:** *Auditório da AIBA*. Av. Aylon Macedo, 919 - Morada Nobre, Barreiras - BA, CEP 47810-035. Brazil

**Activities:** Meeting to evaluate actions developed and discussion of potential projects and partnerships with Nebraska, including: i) modeling and discussion of water resources monitoring systems (surface and groundwater) for the west of Bahia; ii) discussion and proposal of Water Resources Governance Models for western Bahia; iii) training of professionals for water resources management; iv) Implementation of family agriculture development projects using irrigation in western Bahia's Valley region. Participants discussed that the visit has met its proposed objectives and the increased participation of the Water for Food Institute and Nebraska organizations will be detailed in specific projects.



**Participation:** Nebraska delegation, project researchers, AIBA and ABAPA directors and technicians and the President of SPRLEM.

### 14) MEETING WITH RURAL PRODUCERS FROM IRRIGATED DISTRICT OF NUPEBA, BARREIRAS NORTE E RIACHO GRANDE

FRIDAY, 03/02/2018 02:00 PM

**Venue:** *Sala de reuniões AIBA/ABAPA*. Av. Aylon Macedo, 919 - Morada Nobre, Barreiras - BA, CEP 47810-035. Brazil

**Activities:** Meeting with Mr. Aurélio Soares (Executive Manager of the Irrigated District of Nupeba and Riacho Grande), Mr. Orli Link (President of the Rural Producers Association of the Barreiras Norte Irrigated District), Mr. Cícero Tavares (Executive Manager of the Barreiras Norte Irrigated District). The producers presented their irrigation production and control systems. Prof. Everardo Mantovani presented the technologies Irriplus irrigation management system in small and medium irrigated areas and the transfer of this technology. Irriplus is a company hatched from the UFV system of Technology Based Business Incubator.



Participants: Prof. Everardo Mantovani e Prof. Aziz Galvão (UFV/DWFI-UNL).

## 15) MEETING WITH AIBA INSTITUTE

FRIDAY, 03/02/2018 02:00, 16:00

**Venue:** *Sala de reuniões AIBA/ABAPA. Av. Aylon Macedo, 919 - Morada Nobre, Barreiras - BA, CEP 47810-035. Brazil.*

**Activities:** Meeting with the AIBA Institute on human resource training for the sustainable management of water resources in the west of Bahia. The participants discussed and proposed the structure of the course on water management. The teaching staff, methodology and administrative structure were also detailed. The course aims to form leaders in water resources management in western Bahia. The course will include professors from UFV, UFOB, UNEB, FASB, and the University of Nebraska as well as experts from AIBA. The course will draw upon Nebraska's Water Leaders Academy, where professionals from diverse areas develop teams focused on regional and local water challenges. This methodology allows students to apply theoretical concepts in specific conditions, interacting with professionals from different sectors. The course also envisions a technical visit to Nebraska, in which participants will have the opportunity to see first-hand the experiences and projects presented by the Nebraska delegation during their visit to Bahia. The course is scheduled to begin in the second half of 2018.



**Participants:** Dr. Helmut Kiekhöfer, Dra. Alessandra Chaves, Eng. Glauciana Araújo, Prof. Everardo Mantovani, Prof. Aziz Galvão (UFV/DWFI-UNL) e Acadêmico Ruã Coutinho (UFV)

## 16) PARTICIPATION IN THE EVENT "PASSARELA DA SOJA"

SATURDAY, 03/03/2018 07:00 AM

**Venue:** *Campo Experimental da Fundação Bahia. Rodovia BR 020/242, S/N - Zona Rural, Luís Eduardo Magalhães - BA, 47850-000. Brasil*

**Activities:** Participation in one of the "Passarela da Soja" demonstration stations. The event was organized by the Bahia Foundation and EMBRAPA. Prof. Everardo Mantovani presented to an audience of 500 people about the partnership, purpose and importance of the projects on surface water, groundwater and land use change in western Bahia. The main focus was to explain how scientific knowledge could help in the debate on the subject, providing information that allows, on one hand, social stability and, on the other, rational development of irrigated agriculture in western Bahia.



**Participants:** Mr. Celestino Zanella (AIBA), Mr. Júlio Busato (ABAPA) e Prof. Everardo Mantovani (UFV)

## 17) VISITA TO THE AIBA EXPERIMENTAL FARM PAULO MIZOTE

SATURDAY, 03/03/2018 08:00 AM

**Venue:** *Fazenda Decisão Rio Branco*. Rod. Anel da Soja, km 25 a esq. Estrada do Café, km 18 - Zona Rural, Barreiras - BA, CEP 47800-000. Brazil

**Activities:** Visit to AIBA Experimental Farm Paulo Mizote. The Superintendent of the AIBA Institute presented the programs supported by the AIBA Association, in particular the Young Apprentice Program. This program is coordinated by AIBA, CETEP and SENAR / FAEB / SPRB, with the support of CODEVASF and the Ministry of Labor. Prof. Aziz Galvão visited the experimental farm facilities, which include infrastructure for classes, an entomology laboratory, food processing facilities and experimental fields with cotton, soybean, cassava, corn, fruit



and vegetable crops. The AIBA Institute Superintendent Dr. Helmuth Kiekhöfer highlighted the interaction of the entomology laboratory with pesticide companies through the provision of insects for product development and biological control specific to the region. The collaboration with the nutrition course of the Federal University of Western Bahia, which uses the industrial kitchen facilities for hands-on learning, was highlighted by Profa. Adriana Kiekhöfer, Pro-Rector of Administration and Infrastructure of UFOB. During the visit, a project proposal was discussed in the area of irrigated agriculture for small-scale farming, with a focus on training young people from the Young Apprentices course and family farms in the region. Former program participant Camila commented on her positive experience at school and the expectations of the region's family farmers.

**Participants:** Dr. Helmut Kiekhöfer (IAIBA), Profa. Adriana Kiekhöfer (UFOB), Dra. Alessandra Chaves e Eng. Glauciana Araújo (AIBA), Prof Aziz Galvão (UFV/DWFI-UNL) e Undergraduate Student Ruã Coutinho (UFV)



## ORGANIZATIONS REPRESENTED

### **Public Institutions**

1. ADAB: Agência de Defesa Agropecuária da Bahia
2. ALBA: Assembleia Legislativa da Bahia
3. CASA CIVIL: Casa Civil do Governo do Estado da Bahia
4. CERB: Companhia Ambiental e de Recursos Hídricos da Bahia
5. EMBASA: Empresa Baiana de Água e Saneamento
6. GOVERNADORIA DA BAHIA: Gabinete do Governador do Estado da Bahia
7. INCRA: Instituto Nacional de Colonização e Reforma Agrária
8. INEMA: Instituto do Meio Ambiente e Recursos Hídricos do Estado da Bahia
9. MPBA: Ministério Público do Estado da Bahia
10. PMBA/CPRO: Polícia Militar da Bahia / Comando de Policiamento Regional Oeste
11. PREFEITURA DE BARREIRAS, BA
12. PREFEITURA DE LUÍS EDUARDO MAGALHÃES, BA
13. PREFEITURA DE SALVADOR, BA
14. SEAG- BARREIRAS: Secretaria da Agricultura de Barreiras, BA.
15. SEAG-LEM: Secretaria da Agricultura de Luís Eduardo Magalhães, BA
16. SEAGRI: Secretaria de Agricultura, Pecuária, Irrigação Pesca e Aquicultura do Estado da Bahia.
17. SEINFRA: Secretaria de Infraestrutura do Estado da Bahia
18. SEMA: Secretaria de Meio Ambiente do Estado da Bahia
19. SEMA-CORRENTINA: Secretaria de Meio Ambiente de Correntina, BA
20. SEMA-LUÍS EDUARDO: Secretaria de Meio Ambiente de Luís Eduardo Magalhães, BA
21. SEMA-RIACHÃO DA NEVES: Secretaria de Meio Ambiente de Riachão da Neves, BA
22. SEMATUR: Secretaria de Meio Ambiente e Turismo de Barreiras, BA
23. SEPLAN: Secretaria de Planejamento do Estado da Bahia
24. SIHS: Secretaria de Infraestrutura Hídrica e Saneamento do Estado da Bahia

### **Organizations representing Famers, Agro-industries and Professionals**

25. ABAF: Associação Baiana das Empresas de Base Florestal
26. ABAPA: Associação de Produtores de Algodão da Bahia
27. ACRIOESTE: Associação dos Criadores de Gado do Oeste da Bahia
28. AEAB: Associação dos Engenheiros Agrônomos de Barreiras
29. AIBA: Associação de Produtores e Irrigantes da Bahia
30. APROBAN: Associação do Produtores do Barreiras Norte
31. COOLIBA: Cooperativa de Trabalho dos Profissionais Liberais da Bahia
32. CREA-BA: Conselho Regional de Engenharia e Arquitetura da Bahia
33. FAEB/AGROPOLO: Federação da Agricultura do Estado da Bahia
34. FIEB: Federação das Indústrias do Estado da Bahia
35. FUNDEAGRO: Fundo para o Desenvolvimento do Agronegócio do Algodão
36. SINDIFIBRAS: Sindicato das Indústrias de Fibras Vegetais no Estado da Bahia
37. SPRB: Sindicato dos Produtores Rurais de Barreiras
38. SPRLEM: Sindicato dos Produtores Rurais de Luís Eduardo Magalhães

### **Organizations involved in Water Resources Governance**

39. CBHC: Comitê da Bacia Hidrográfica do Rio Corrente
40. CBHG: Comitê da Bacia Hidrográfica do Rio Grande
41. CBHSF: Comitê da Bacia Hidrográfica do Rio São Francisco
42. CCRMSF: Câmara Consultiva Regional do Médio São Francisco
43. CODETER: Colegiado de Desenvolvimento Territorial da Bacia do Rio Grande
44. CODEVASF: Companhia de Desenvolvimento do Vale do Rio São Francisco e Parnaíba

- 45. CONERH: Conselho Estadual dos Recursos Hídricos – Bahia
- 46. CPRM: Companhia de Pesquisas de Recursos Minerais

#### **Research, Teaching and Extension Institutions**

- 47. CETEP-OESTE: Centro Territorial de Educação Profissional da Bacia do Rio Grande
- 48. FASB: Faculdade São Francisco, Barreiras.
- 49. FUNDAÇÃO BAHIA: Fundação de Pesquisa da Bahia
- 50. UCSAL: Universidade Católica de Salvador
- 51. UFBA: Universidade Federal da Bahia
- 52. UFOB: Universidade Federal do Oeste da Bahia
- 53. UFRJ: Universidade Federal do Rio de Janeiro
- 54. UFV: Universidade Federal de Viçosa
- 55. UNEB: Universidade Estadual da Bahia
- 56. UNOPAR: Universidade do Oeste do Paraná: Núcleo Luís Eduardo Magalhães

#### **Agricultural and Forestry Farms**

- 57. AGRI BRASIL: Empresa Agrícola
- 58. FAZENDA COLOMOTIN: Empresa Agrícola
- 59. FAZENDA ENCANTO DAS FRUTAS: Propriedade Rural Encanto das Frutas
- 60. FAZENDA KANSAS: Empresa Agrícola
- 61. FAZENDA MARIA: Empresa Agrícola
- 62. FAZENDA MARIINHA: Propriedade Rural Mariinha
- 63. FAZENDA VALE : Empresa Agrícola
- 64. FAZENDA VALE DO URSO: Empresa Agrícola
- 65. FAZENDA VIDA MANSA: Empresa Agrícola
- 66. FAZENDA ZUTTON: Empresa Agrícola
- 67. FAZENDAS BUSATO: Empresa Agrícola
- 68. FAZENDAS DECISÃO : Empresa Agrícola
- 69. FLORYL: Empresa Florestal
- 70. NORDESTE FLORESTAL E AGRÍCOLA: Empresa Agrícola e Florestal
- 71. SANTA COLOMBA: Empresa Agrícola
- 72. SANTA RITA DE CASSIA: Empresa Agrícola
- 73. SCHMIDT AGRÍCOLA: Empresa Agrícola
- 74. SEMENTES OLEIMA: Sementes Oleima
- 75. SLC: Empresa Agrícola
- 76. TRIFLORA: Empresa Agrícola

#### **Agricultural Input, Processing and Service Enterprises and Communications Enterprises**

- 77. ADM: Empresa de Comercialização e processamento
- 78. AMAGGI SLC: Empresa de comercialização e processamento
- 79. BAHIA DE VALOR: Portal de Notícias
- 80. CETREL: Empresa de Tratamento de Efluente
- 81. FOCKINK: Indústria de Eq. de Irrigação
- 82. IRRIGABEM: Empresa de Irrigação
- 83. IRRIGER: Empresa de irrigação
- 84. KALLIANDRA: Empresa de Transporte
- 85. PIVODRIP: Empresa de Irrigação
- 86. R DENER: Empresa de Perfuração de Poços
- 87. SANDERSON CONSULTORIA E PLANEJAMENTO: Empresa de Serviço
- 88. TV ARATU / REDE SBT: Rede SBT de Televisão

- 89. TV ASSEMBLEIA: TV Assembleia
- 90. TV BAHIA/ REDE GLOBO: Rede Globo de Televisão
- 91. TV CAMARA: TV Assembleia
- 92. UFC ENGENHARIA: Consultoria
- 93. VALMONT: Indústria de Eq. de Irrigação

#### **Development Agency and Financial Institutions**

- 94. BB: Banco do Brasil
- 95. BNB: Banco do Nordeste do Brasil
- 96. DESENBAHIA: Agência de Fomento do Estado da Bahia SA.

#### **NGOs, Foundations and Institutes**

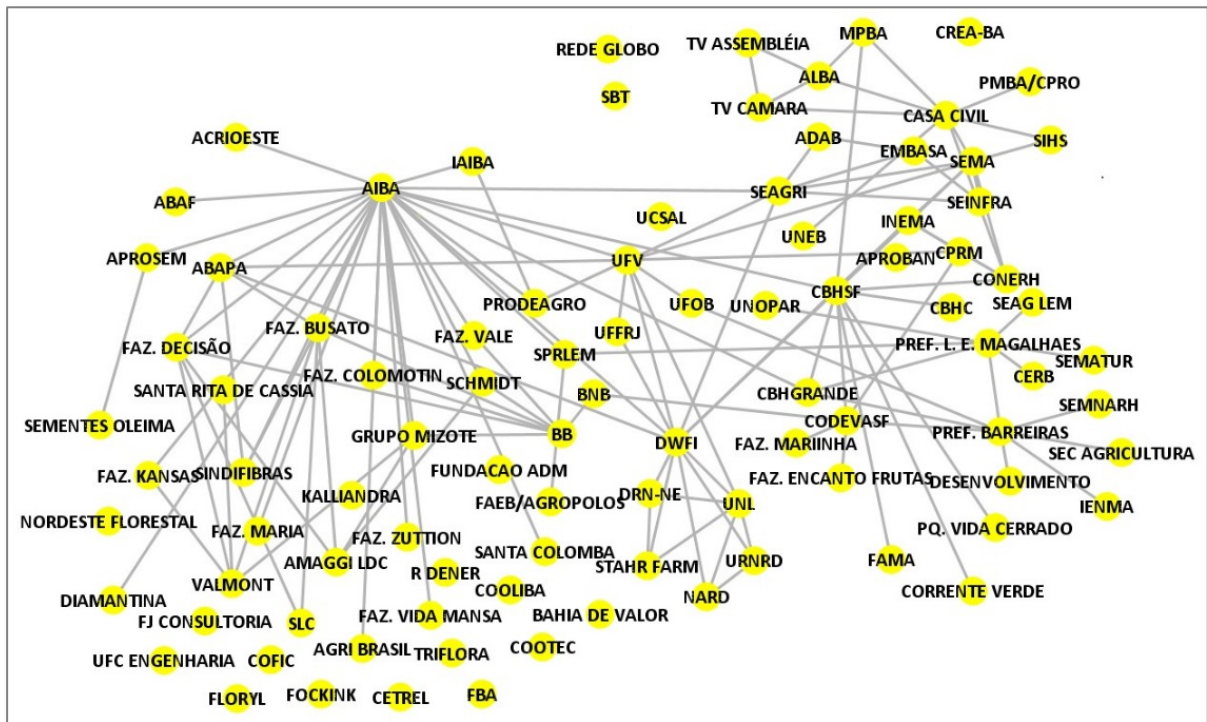
- 97. 10-ENVOLVIMENTO: Organização Ambiental
- 98. AMINA: Associação Amigos da Natureza
- 99. CABER: Cooperativa dos Catadores de Produtos Recicláveis de Barreiras e Região Oeste da Bahia
- 100. CORRENTE VERDE: Associação Ambientalista Corrente Verde
- 101. FAMA: Fórum Alternativo Mundial da Água
- 102. FUNDACAO ADM: Fundação de Empresa de Comercialização e Processamento Agrícola
- 103. IAIBA: Instituto AIBA
- 104. PARQUE VIDA CERRADO: Área de Conservação
- 105. PRODEAGRO: Programa de Desenvolvimento do Agronegócio

#### **Nebraska Organizations**

- 106. DRN-NE: Departamento de Recursos Naturais do Nebraska
- 107. DWFI/UNL : Instituto *Water for Food* da Universidade do Nebraska
- 108. NARD: Associação de Distritos de Recursos Naturais do Nebraska
- 109. STAEHR FARM: Fazenda Família Staehr, York – Nebraska.
- 110. UNL: Universidade de Nebraska-Lincoln
- 111. URNRD: Distrito de Recursos Naturais Upper Republican

These organizations and their employees maintain professional links with each other, and the analysis of this network is highly relevant to projects in the area of monitoring, information dissemination, capacity building, and especially water resources governance. An initial and incomplete model of "social network analysis" is presented below.





*Relationship network between participating organizations*

## CONTACTS

### Nebraska Delegation:

- **Dr. Peter McCornick.** Diretor Executivo DWFI/UNL
- **Dr. Christopher Neale.** Diretor Científico DWFI/UNL
- **Dr. Nicholas Brozovic.** Diretor de Política DWFI/UNL
- **Prof. Aziz Galvão S. Junior.** Pesquisador Visitante do DWFI/UNL, Prof. DER-UFV.
- **Sr Jasper Fanning.** Gerente Geral do Distrito de Recursos Naturais (NRD) Upper Republican.
- **Sr. Jesse Bradley,** Diretor de Programas e Projetos do Depto. de Recursos Naturais do Estado de Nebraska (DNR).
- **Sr. Jerry Stahr,** Produtor Rural no condado de York, NE
- **Prof. Daran Rudnik,** Extensionista especializado em Irrigação DWFI/UNL
- **Prof. Troy Gilmore.** Professor de Hidrologia e Hidrogeologia DWFI/UNL

### Farmers Associations (AIBA / IAIBA / ABAPA / SRLEM/SRB)

- **Sr. Celestino Zanella\*:** Presidente da AIBA, Produtor Rural
- **Sr. Júlio César Busato\*:** Presidente da ABAPA, Produtor Rural
- **Sra. Carminha Missio\*:** Presidente do SPRLM, Produtora Rural
- **Sr. Moises Schmidt:** Presidente do SPRB, Produtor Rural
- **Dra. Alessandra Chaves:** Bióloga, DS Botânica. Diretora de Meio Ambiente AIBA
- **Eng<sup>a</sup>. Glauciana Araújo:** Agrônoma. Gerente de Projeto AIBA
- **Eng<sup>o</sup>. Cisino Lopes:** Agrônomo. Diretor de Águas e Irrigação AIBA
- **Dr. Helmuth Kieckhofer:** Médico Veterinário. Superintendente do Instituto AIBA

### Brazilian Research Team

- **Prof. Everardo Mantovani\*:** Professor, DEA, UFV, Eng. Agrícola; PhD
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- **Prof. Fernando Falco Pruski\*:** Professor, DEA, UFV, Eng. Agrícola; UFV, Pos Doc
- **Prof. Marcos Heil Costa\*:** Professor, DEA, UFV; Eng. Agrícola, PhD, Pos Doc
- **Prof. Eduardo Antônio Gomes Marques\*:** Professor, DEC, UFV; Geólogo, PhD, Pos Doc
- **Prof. Gerson Cardoso da Silva Júnior\*:** Professor, DGP - UFRJ, Geólogo, PhD.
- **Prof. Luiz Gustavo Henriques do Amaral:** Professor, CCET-UFOB, Eng. Mecânica, PhD

### Bahia State Government and Legislative Camer

- **Governador Sr. Rui Costa.** Governador do Estado da Bahia
- **Secretario Sr. Vitor Bonfim\*:** Secretário da SEAGRI Governo da Bahia
- **Sr. José Geraldo dos Reis Santos\*:** Secretário a SEMA Governo da Bahia
- **Sr. Cássio Ramos Peixoto:** Secretário da SIHS Governo da Bahia
- **Sr. José Olímpio Rabelo de Moraes\*:** Diretor de Revitalização de Bacias Hidrográficas - SIHS
- **Sra. Márcia C. T. de Araújo Lima\*:** Diretora Geral INEMA
- **Sr. Eduardo Farias Topázio\*:** Diretor de Águas INEMA
- **Mr. Eduardo Salles\*:** Deputado Estadual da Bahia; Ex-Secretario da SEAGRI;

\* Participants of Brazilian Delegation, which visited Nebraska in April 2017.

## GEOREFERENCED MAP OF ACTIVITIES



*Location of activities undertaken in Salvador: 1) Internal Workshop, 2) Meeting at the Public Ministry, 3) International Seminar, 4) Technical Meeting on the Urucuia Aquifer, 5) 2nd Meeting at the Public Ministry and 6) Audience with the Governor, Mr. Rui Costa.*



*Location of activities undertaken in western Bahia: 7) Visit to APA Rio de Janeiro, 8) Visit to Decisão Farm, 9) Visit to Mariinha Farm, 10) Visit to Encanto das Frutas Farm, 11) Second International Seminar, 12) Meeting with Rio Grande and Rio São Francisco Watershed Committes, 13) Internal Workshop, 14) Meeting with irrigation district farmers, 15) Meeting with AIBA Institute, 16) Participation in the Passarela da Soja event, 17) Visit to AIBA Model Farm*



## MEDIA IMPACT

The regional affiliates of two large national private TV networks (Rede Globo and SBT) and two affiliates of the public networks, TV Camera and TV Assembly broadcasted the seminars.

1. TV BAHIA / REDE GLOBO: <http://g1.globo.com/bahia/bahia-rural/videos/v/aplicativo-que-vai-mostrar-nivel-de-agua-do-rio-urucucua-deve-ser-lancado-este-mes/6546796/>
2. TV ASSEMBLEIA: <https://www.youtube.com/watch?v=v7WqTRvZTXk>
3. TV ARATU / REDE SBT:
4. TV CAMARA:

The main newspapers of Salvador and Barreiras, as well as several internet communication vehicles reported the event:

5. A Tarde, Evento debate potencial hídrico da Bahia: <http://www.atarde.uol.com.br/bahia/salvador/noticias/1938901-evento-debate-potencial-hidrico-da-bahia>
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7. Jornal da Mídia, Pesquisa científica descarta possibilidade de escassez de água no Oeste da Bahia, <http://www.jornaldamidia.com.br/2018/02/24/pesquisa-cientifica-descarta-possibilidade-de-escassez-de-agua-no-oeste-da-bahia/>
8. Cerrado Editora, Meio ambiente: estudo hídrico é apresentado por irrigantes no Oeste da Bahia. <http://cerradoeditora.com.br/cerrado/meio-ambiente-estudo-hidrico-e-apresentado-por-irrigantes-no-oeste-da-bahia/>
9. Jornal Dia a Dia, Pesquisa científica descarta possibilidade de escassez de água no Oeste da Bahia: <http://jornaldiadia.com.br/2016/?p=396388>
10. Diário Oficial, ALBA sedia da Assembleia Legislativa da Bahia, <http://www.al.ba.gov.br/midia-center/noticia/28720>
11. Mais Oeste, Pesquisa científica descarta possibilidade de escassez de água no Oeste da Bahia: <http://www.maisoeste.com.br/2018/03/06/pesquisa-cientifica-sobre-potencial-hidrico-do-oeste-da-bahia-e-apresentada-a-populacao-da-regiao/>
12. ABAPA, Pesquisa científica descarta possibilidade de escassez de água no Oeste da Bahia: <http://abapa.com.br/mais-noticias/pesquisa-cientifica-sobre-potencial-hidrico-da-bahia-descarta-possibilidade-de-escassez-de-agua-na-regiao/>
13. Jornal Classe A, Pesquisa científica descarta possibilidade de escassez de água no Oeste da Bahia: <https://www.classelem.com.br/single-post/2018/03/01/Pesquisa-cient%C3%ADfica-sobre-potencial-h%C3%ADdrico-da-Bahia-descarta-possibilidade-de-escassez-de-%C3%A1gua-na-regi%C3%A3o>
14. Jornal Expresso, Projeto vai quantificar potencial hídrico da região Oeste da Bahia. <https://jornaloexpresso.wordpress.com/2018/02/28/projeto-vai-quantificar-potencial-hidrico-da-regiao-oeste-da-bahia/>
15. Agrolink, Bahia tem potencial hídrico para ampliar a irrigação. [https://www.agrolink.com.br/noticias/bahia-tem-potencial-hidrico-para-ampliar-irrigacao\\_393548.html](https://www.agrolink.com.br/noticias/bahia-tem-potencial-hidrico-para-ampliar-irrigacao_393548.html)
16. Novoeste, <http://www.novoeste.com/index.php?page=destaque&op=readNews&id=33871>
17. Destak Notícia, Pesquisa científica sobre potencial hídrico do Oeste da Bahia é apresentada à população da região. <http://www.destaknoticia.com/v2/2018/03/03/pesquisa-cientifica-sobre-potencial-hidrico-do-oeste-da-bahia-e-apresentada-a-populacao-da-regiao/>

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20. Hailton Pereira, <http://www.hailtonpereira.com/2018/03/pesquisa-cientifica-sobre-potencial.html>
21. Folha Geral, <https://www.folhageral.com/noticia/bahia/barreiras/2018/03/pesquisa-cientifica-sobre-potencial-hidrico-do-oeste-da-bahia-e-apresentada-populacao-da-regiao/#axzz58sBDoqfK>
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Dra. Alessandra Chaves (AIBA) e Eng. Agron. Glauciana Araújo (AIBA).**  
Lincoln (Nebraska, USA), Viçosa (MG, Brazil) and Barreiras (BA, Brazil). 16/03/2018.

*This report is available at [www.agroplusufv.com.br/projeto-urucuia](http://www.agroplusufv.com.br/projeto-urucuia).*

*We apologize for any errors or omissions. Please contact any of the authors for corrections, using the email addresses below. Thank you!*

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