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Wisdom at the Source of the Blue Nile



Blue Nile Water Institute

Members meeting to revise directorates
(research units) and thematic areas

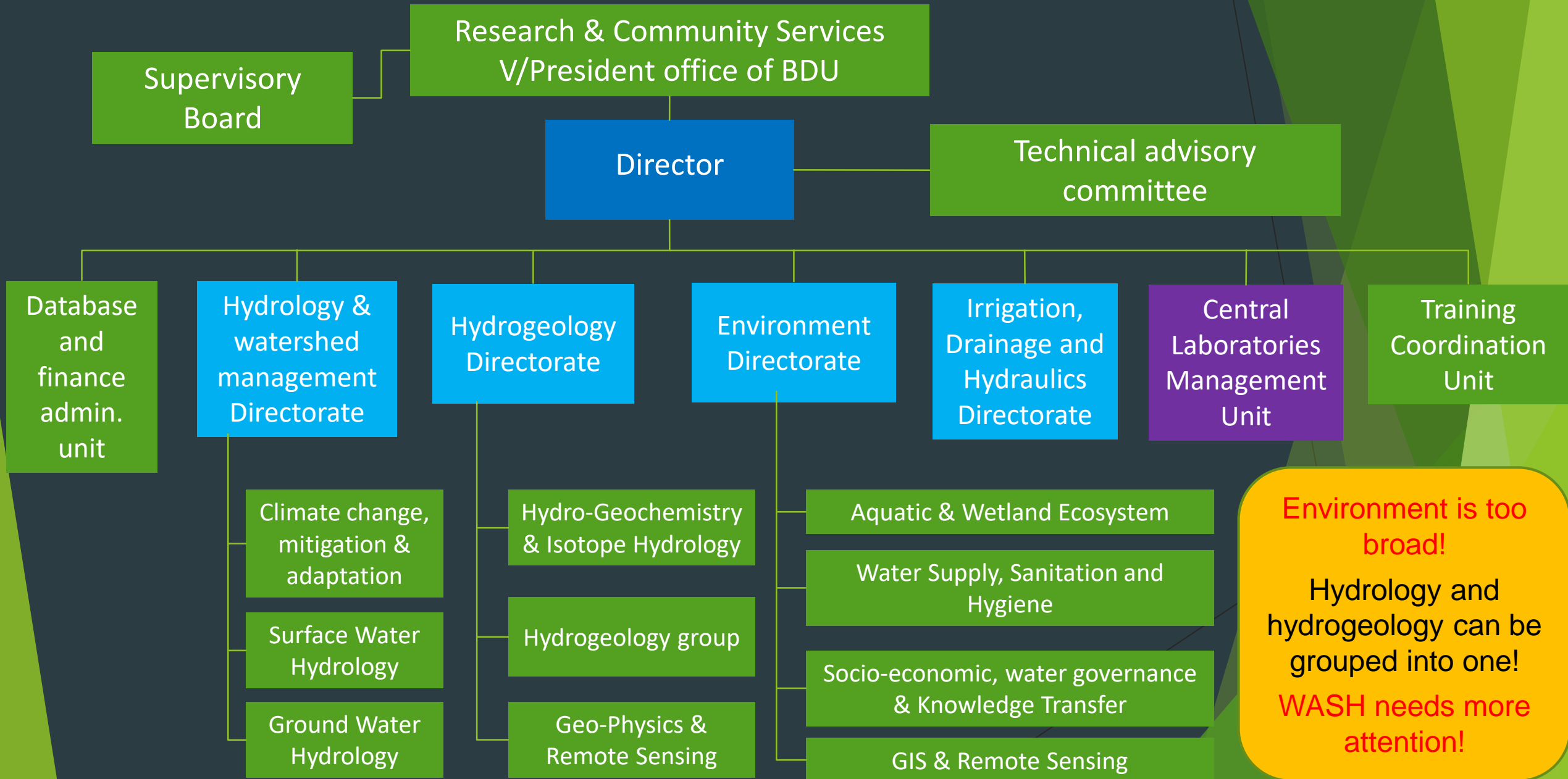
14 Jan. 2020

Introduction

- BNWI was established in 2012 to assist realization of BDU's vision to become one of the top ten research universities in Africa by 2025.
- **Vision:** To be a center of excellence (COE) in water research, innovation and development in Africa.
- **Mission:** To conduct research in the broad field of water and related issues and to facilitate innovation and knowledge creation to serve communities at the grassroots, researchers, policy makers and development partners.

Role: To synergize water related research, innovation and development activities of BDU with the objective of producing a joint effect greater than the sum of the separate effects.

Blue Nile Water Institute Organization Chart (current)



Major achievements of BNWI (2012 – 2018)

1. Research activities: About 127 research works, of which 42 by masters students and 12 by PhD students
2. Community and consultancy services
3. Establishment of a central laboratory (at BiT)
4. Establishment of model sites: 2 community-based aquaculture ponds in Mecha Woreda
5. Workshop and symposium: Nile International Symposium
6. Joint MSc program (CAPAQUA project): with AAU (Aquatic ecosystems and environmental management - AEEM)

Challenges of BNWI

1. Poor financial administration and reliance on government budget
2. Less attention to establishment of model watershed management sites
3. Inadequate publication of scientific research papers
4. Less attention to develop research database system
5. **Poor identification of thematic areas**
6. Lack of laboratory building and infrastructure
7. **Lack of institutional autonomy and weak human resource management system**
8. Weak cooperation and linkage with various stakeholders

Thematic and sub-thematic areas of BNWI (Strategic Plan, 2012-2017 E.C.)

1. Hydro (geo) logy and watershed management

- ▶ Ground water resource
- ▶ Isotope hydrology and hydrochemistry
- ▶ Surface and ground water interaction
- ▶ Climate change and atmospheric hydrology
- ▶ Erosion and sedimentation
- ▶ Soil and water conservation
- ▶ Hydro informatics
- ▶ Integrated watershed management

In the proposed strategic plan, hydrology and hydrogeology are grouped into one thematic area, **but in the organogram, they have separate directories.**

Thematic and sub-thematic areas of BNWI (cont.)

2. Water resource development and management

- ▶ Agricultural water management
- ▶ **Water supply and sanitation**
- ▶ Irrigation technologies
- ▶ Water harvesting techniques
- ▶ Hydraulics and hydropower

3. Aquatic Ecosystem and Invasive Species

- ▶ Water Quality
- ▶ Pollution and waste management
- ▶ Aquaculture and Fisheries
- ▶ Invasive Species
- ▶ Wetland ecology and management

In the organogram, Water supply and sanitation is included in the Environment directorate, but here it is included in a different thematic area.

Thematic and sub-thematic areas of BNWI (cont.)

4. Socio-economics and Institutional analysis

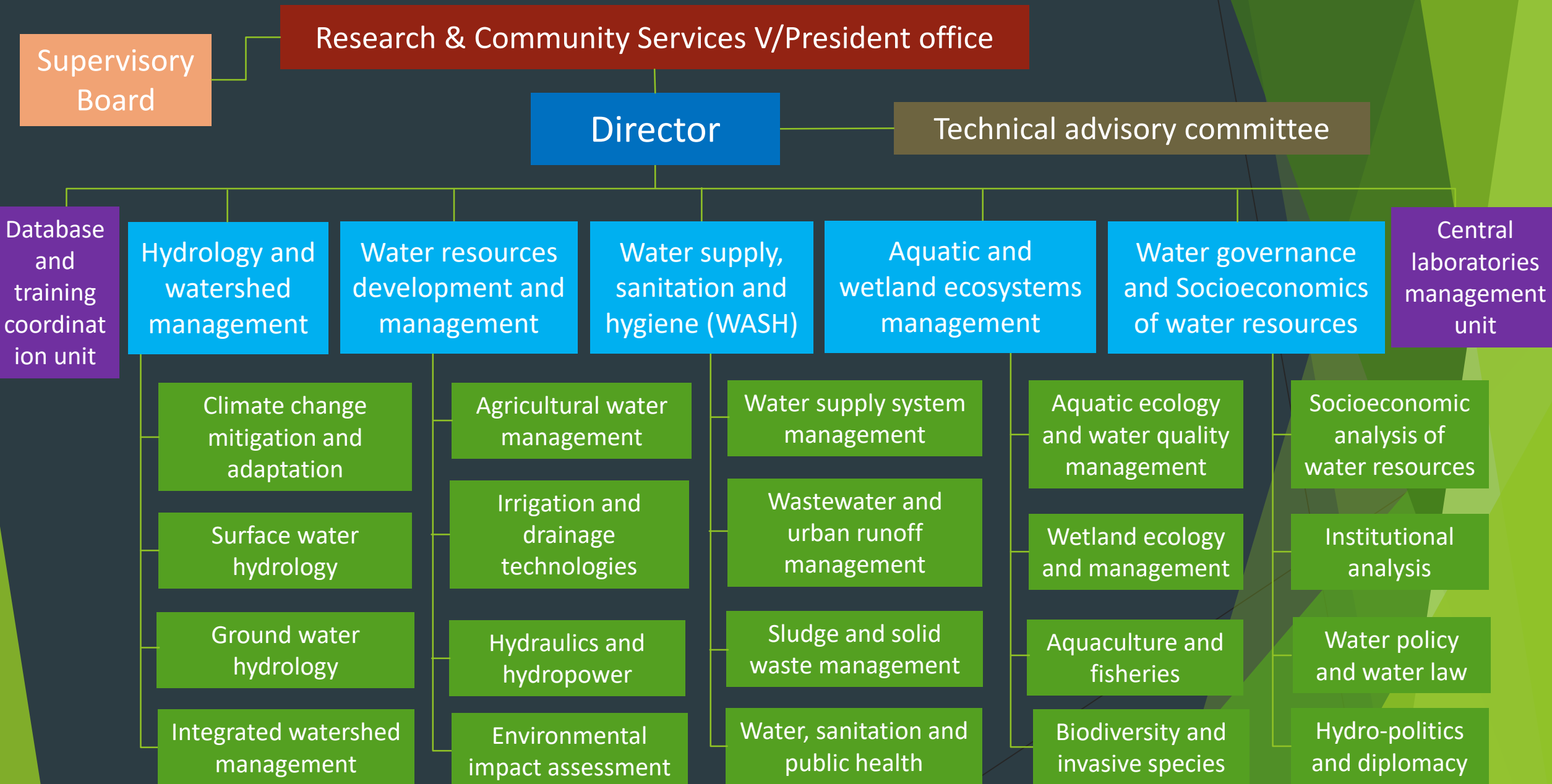
- ▶ Economic valuation of water resource
- ▶ Socio-economic impact assessments
- ▶ Livelihood strategies
- ▶ Socio-economic feasibility studies
- ▶ Institutional analysis of water resource management

5. Water governance

- ▶ Water policies, laws and enforcement strategies
- ▶ Hydro-politics and diplomacy
- ▶ Water and society

Maybe it is possible to group these two thematic areas into one.

Blue Nile Water Institute Organization Chart (Proposed)



Rapid urbanization and industrialization

Failure to provide safely managed water supply and sanitation services

Ineffective management of liquid and solid wastes

Environmental pollution, public health risk

Eutrophication of lakes and invasive species

Human population growth **without technological dev't**

What researches should be done to achieve:

Effective management and sustainable utilization of water and related resources?

Water resources depletion and conflict of interest

Farmland expansion overgrazing and intensive agriculture

(deforestation, encroachment to wetlands, use of agrochemicals, too much water abstraction in the dry season)

Land degradation, accelerated erosion, water pollution

Sedimentation or siltation of lakes and dams

A method for setting priorities of research agenda

1. What is the expected value of the research?

- ❖ This refers to the importance attached to successful results, either in terms of **direct problem solving** or **advancement of fundamental knowledge** of water resources.

2. To what extent is the research of national/regional significance?

- ❖ This tells the importance of the research at national/regional level.

3. Does the research fill a gap in knowledge?

- ❖ Is the research not **duplicative** of other/previous efforts?
- ❖ Does the research have **interdisciplinary** nature?
- ❖ Does the research incorporate **uncertainty** concepts and measurements?
- ❖ Does the research address the role of **adaptation** to the ever-changing environment?

A method for setting priorities of research agenda

4. How well is this research area progressing?

- ❖ Whether prior efforts in this area have produced results or not; and why new efforts are needed?

5. How does the research area complement the overall water resources research portfolio? A diversified portfolio should capture:

- ❖ Multiple national and regional objectives related to increasing **water availability**, improving **water quality and ecological functions**, and strengthening **institutional and management practices**.
- ❖ Short-, intermediate-, and long-term research goals supporting national and regional objectives
- ❖ Data collection necessities or needs to support the above and other related research activities

So, what should be the top priority research agendas in each research unit and sub-units of **BNWI** so as to contribute to the achievement of effective management and sustainable utilization of water resources at regional and national level?

The next several slides show priority research topics which were identified when BNWI was established in 2012. **These can be used as a reference.**

Priorities of Strategies

Research

- The thematic areas are Water and Environment ,Watershed hydrology and management and Hydro-geology
- The institute is also mandated to model development and filling human capacity gaps through providing tailor made trainings,
- World class applied and policy oriented research in hydrology and watershed management, hydro-geology and largely on environment spearheads.
- The following are not all but priorities of research in the strategic period (2012 to 2017).

Hydrology and Watershed Management Research

1. Conduct study on optimization and allocation of the water use of Lake Tana basin
2. Conduct research on adaptation and mitigation measures of climate change in the Lake Tana basin
3. Evaluate the impact of soil and water conservation activities in the Lake Tana basin
4. Study the hydrological process of Lake Tana basin
5. Quantify and mapping of sediment and nutrient loading rates of Lake Tana
6. Develop erosion risk map of Lake Tana basin
7. Identify and map flood zones of the Lake Tana basin

Hydro-geology Research

1. Study the ground flow water dynamics of Tana and Beles Sub-basin in 2013-2017
2. Study the hydro-geological characterization of the Tana Basin
3. Estimate ground water potential, hydrological mapping and aquifer characterization of the Tana basin
4. Study the ground- surface water interaction and ground water recharge estimation at Lake Tana basin

Environment Research

1. Quantify and map the wetland resources and study the bio-diversity of wetlands at the basin within 3 years
2. Quantify and characterize the aquatic and riverine fauna and flora of Lake Tana basin 2013-2014
3. Study the anthropogenic impact of the local community on biodiversity and ecosystem services at Lake Tana Basin 2013-2015
4. Develop sound management plan of wetlands and aquatic resources that compromise development and environment with 3 years
5. Undertake valuation of wetland ecosystem services in Tana Basin 2013-2017

Environment Research

6. Develop aquatic ecosystem health monitoring indicators at Lake Tana Basin within 2013-2015
7. Design nutrient management strategy in the agricultural catchment of Tana basins
8. Detect water quality problems in the basin.
9. Develop physical, chemical and biological water quality indicators for Lake Tana Basin at the end of 2013
10. Conduct study on the impact of water pollution on public and ecosystem health in Tana basin
11. Assess the public health problem in relation to water pollution and water borne disease

Environment Researches...

12. Study the relationship of flooding with the out breaks of diarrheal diseases for early warning
13. Study the impact of Eutrophication on human and eco-system health problems at Lake Tana basin 2012-2015
14. Quantify and relate the result of water quality findings with international standard guide line at Lake Tana Basin
15. Survey the biology, distribution and occurrence of Water Hyacinth in Blue Nile Basin within 2012-2015
16. Monitor and conduct study about the impact of water Hyacinth with the eco-system itself and other biodiversity

Environment Research...

17. Analyze policy gaps that lead to miss- use of water and water related resources
18. Conduct institutional research and draw policy recommendations in 2012 and 2013
19. Identify and adapt appropriate technologies (of what?)
20. Identifying the driving forces of environmental degradation
21. Study the magnitude of human impact on fauna, flora and physical resources of the Lake Tana Basin

Environment Research...

22. Study the magnitude of human impact on fauna, flora and physical resources of the Lake Tana Basin
23. Study and refine the past and present land use and land cover of the basin within 3 years
24. Study livelihood of the local community and identify the degree of dependency on the existing natural resources at the basin
25. To study the magnitude of climate change using retrospective and current data at Lake Tana basin in 2013-2015