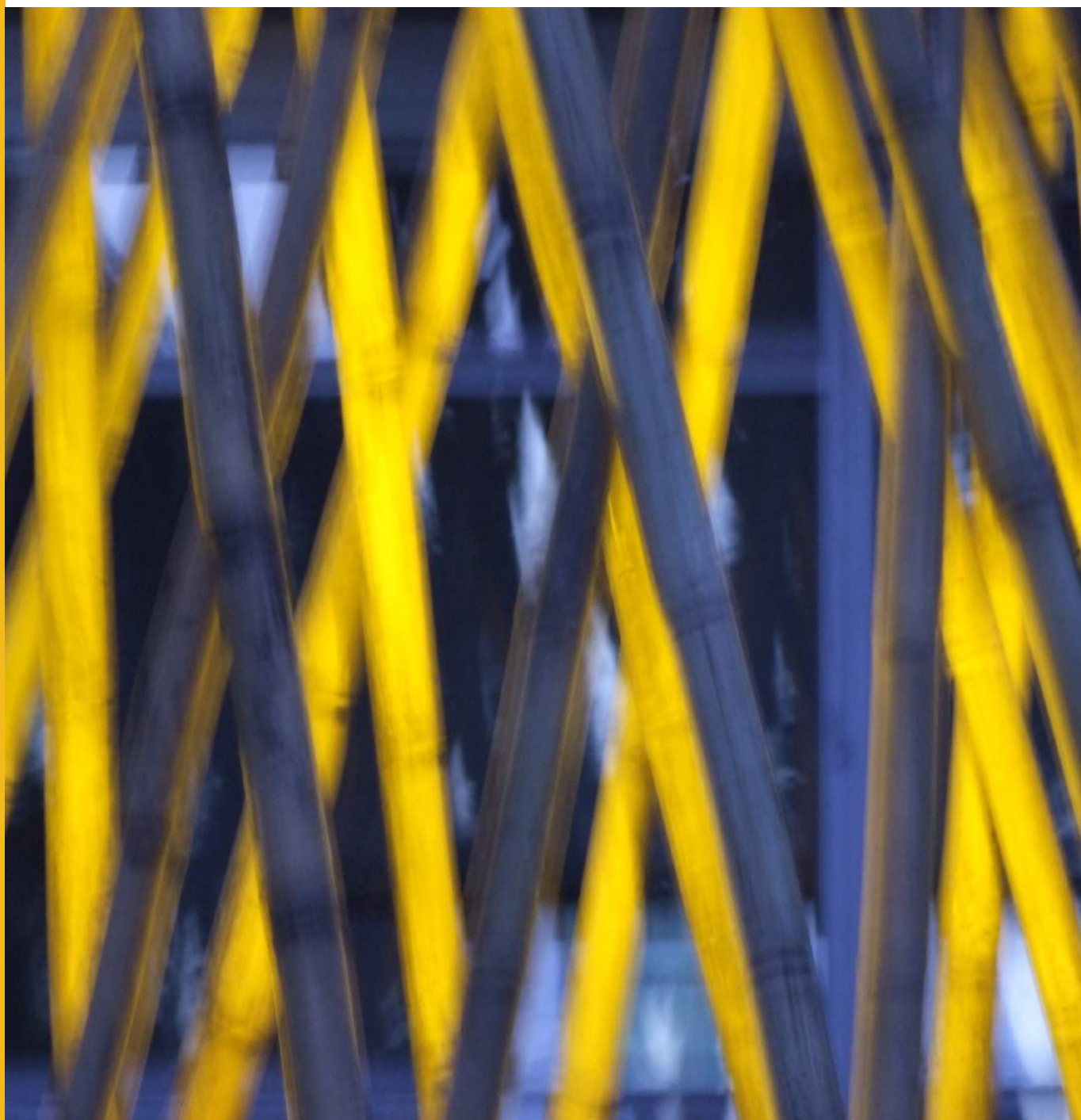
EiABC
Ethiopian Institute of Architecture, Building Construction and City Development
Addis Ababa University

www.eiabc.edu.et

60TH ANNIVERSARY EDITION



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EiABC is an autonomous institute of technology under Addis Abeba University. It was first established in 1954 as Building College. Getting its new name in 2010, it’s becoming a leading academic institute in Ethiopia on such topics as housing and sustainability.

With a variety of pioneering researches and 60 years of journey under the belt; its bachelors’, masters’ and doctorate programs’ are growing stronger than ever. In 2014, EiABC is proud to celebrate 60 years of service.

Directors' Message

Fasil Ghiorgis
SUPERVISORY BOARD

EiABC is focused on educating professionals and providing university- level knowledge to serve Ethiopia's needs. It is the mission of EiABC to educate prospective graduates, provide knowledge and develop skills in design, building technology, management, and planning for the building industry as well as city and town actors in the public and private sector. It conducts technology based on priorities that reflect the needs of the country, the regions, woredas, kebeles and private businesses.

EiABC is committed to create an environment that is conductive to the cultivation of social skills and entrepreneurship among students and staff, to serve as a model for other educational institutions within the country and provide them with the necessary technological education and advanced training. In this regard, EiABC cooperates with all relevant stakeholders in promoting and developing local, regional and national technological knowhow.

It is the ambition of EiABC to promote future oriented strategies in Architecture and Architectural Design, Building Technology and Structural Design, Project and Construction Management, City Development, Housing and Urban Design, Environmental Planning and Design, as well as Theory and History and Conservation of Ethiopian Architectural and Cultural Heritage that implement new capacities regarding the prospective development of Ethiopia and its professions in the building sector.

In order to ensure exemplary performance, EiABC operates with the highest possible standards of professionalism and ethics and seeks to provide high- quality services as efficiently as possible. EiABC leadership is dedicated to excellence and has a strong will to succeed and excel in its endeavors. It is characterized by the integrity and competence needed to accomplish its mission and resolute focus on the strategic issues.

Joachim Dieter
SCIENTIFIC DIRECTOR

Welcome at EiABC, the Ethiopian Institute of Architecture, Building Construction and City Development. Founded in 1954 as the "Ethio-Swedish Building College" and later merged with the Addis Ababa University, EiABC was reformed in 2010 as an autonomous Institute of Technology under the umbrella of Addis Ababa University to foster the development, capacity and competitiveness of industries in the field of Architecture, Design, Construction, Urbanism, Environmental Planning, Management and Technology. We provide study programs at Bachelor, Master and PhD levels; we conduct research and offer consultancies in all fields concerning the built environment. EiABC addresses a wide range of fields, such as private sector support, international standards and quality management, and professional education at university levels.

EiABC is a multidisciplinary think tank operating under the headline DESIGN AND SUSTAINABILITY, where experts from all fields in the built environment, covering a lot of different specialties and competences, can work together on design strategies for the future cities of Ethiopia, and the city of Addis Ababa. All our experts deal with the question of future urban developments, and all have the competence to carry out research on the highest professional level. Our direct involvement in the city development and urban planning is of high importance, and in the history we, EiABC together with the City of Addis Ababa, had many successful cooperations.

With the configuration of our curriculum and education in all BSc and MSc programs we react to the actual needs of Ethiopia, and the current needs in the building sector. The needs are clearly identified; new towns, housing and infrastructure for millions in the country, condominiums and infrastructure for hundred thousands in Addis Ababa. EiABC's responsiveness to the national needs is underlined by our close collaboration with the private and public sector. Research and academic consultancies are targeted to technology and knowledge transfer for direct application in practice.

Dr. Ing. Béatrice Delpouve
MANAGING DIRECTOR

As design and sustainability is the guiding theme of EiABC, we provide study programs at different levels; we conduct research and offer consultancies in all fields concerning the built environment. As EiABC understands environmental protection and awareness as an encompassing topic, therefore, with our initiatives like the 'Environment Day' and 'Local Agenda 21' we involve students at an early stage of their education to be conscious on campus and take over responsibilities and ownership with regards to environmental issues. Workshops and conferences are the display window of the institute for the public, the people of Addis Ababa, for our partners in associations, stakeholders and the government, and our chance to discuss and share lessons learned from our daily academic work and research.

One of the key strategies of EiABC is to raise quality in teaching and research through international cooperation. We have decided to be ambitious and to conduct surveys to our stakeholders in order to be closer to their needs and improve the Higher Education in continuous way.

EiABC can be proud of its international connections as so far we have concluded 27 MoU's of international cooperation and strategic partnerships with African and European Universities with extensive cooperation networks. New opportunities from Asia are coming too for capacity building and helping our staff to participate in intensive courses or to achieve their Masters and PhD. Through this EiABC is contributing to the development of the country.

EiABC's responsiveness to the national needs is underlined by our close collaboration with the private and public sector. Our research and academic consultancies are targeted towards technology and knowledge transfer for direct application in practice. Applied research is the strength of the institute and brings us in the lead and ahead. Our EiABC Industry Cluster and the development of new centers such as the National Bamboo Competence Center, Centre for Entrepreneurship and the newborn Research and consultancy incubation are the key elements in addition to the existing centers MRTC and ProtoLab.

I'm looking forward to have a successful and fruitful collaboration with you.

Graduation Ceremony of Class of 2015
February 14th, 2015,
EiABC, A.A, Ehiopia

EiABC at a Glance

African countries show globally the highest degree of population growth, and the Ethiopian capital, Addis Ababa, is amongst the fastest growing cities in the world. Consequently, there is a high demand for highly educated Architects, Planners, Environmentalists, and Construction Managers; a high demand for design models based on the Ethiopian context for new towns, new rural developments, public spaces and facilities, including infrastructure systems; a high demand for scientific and applied research concerning indigenous construction material, building technology, housing and infrastructure, including teaching material; a high demand for good governance and appropriate practice regulations in planning, construction and building.

The inauguration of the Ethiopian Institute of Architecture, Building construction and City Development (EiABC) in March 2010, was an urgent response to the demands of Ethiopia and its younger generation. EiABC has become a leader in excellent education, applied research, as well as in offering consultancy services to the industry and it therefore benefits society as a whole. It offers its students, faculty and researchers an inspiring environment and opens its doors for all partners in the academic and applied fields of the building industry. EiABC has more than 3000 students and offers academic opportunities in various Bachelor, Master and PhD programs. It gained a reputation as the leading Institute of Technology in the field of the built environments and is continuing to offer new chances, study opportunities, and research possibilities to all students, faculties and national as well as international partners.

Statistics*

		Numbers
Academic Programs & Students Numbers	B.Sc. Architecture	800
	B.Sc. Urban & Regional Planning	271
	B.Sc. Construction Technology & Management (Regular)	852
	B.Sc. Construction Technology & Managemet (Extension)	853
	M.Sc. Environmental Planning & Landscape Design	37
	M.Sc. Housing & Sustainable Development	32
	M.Sc. Urban Design & Development	31
	M.Sc. Advanced Architectural Design	10
	PhD Environmental Planning	28
	PhD Urban and Regional Planning	6
	Total Number of Students	**2920**
Academic Staff (Teaching & Research)	Professor	-
	Associate Professor	1
	Assistant Professor	8
	Lecturer	114
	Assistant Lecturer	93
	Graduate Assistant	7
	Technical Assistant	1
	Total Number of Academic Staff	**224**
Expatriate Staff	(incl. DAAD, CIM, Guest Lecturers, Scientific & Managing Director, Project Staff)	**7**
Administrative Staff	Central Administration, Directors' Office & Program Offices	
	Quality Assurance and Reform Unit	
	MRTC Technical Staff (Laboratories)	
	Center for Entreprunership	
	National Bamboo competence center	
	Research & consultancy incubation (RCI)	
	proto Lab	
	International Relations and communication	
	Publication Center	
	Finance Office and Budget	
	Library	
	Student Service	
	ICT	
	Graduate Program Directory	
	Construction Management Office	
	Registrar Office	
	Human Resource Office	
	General Service(Gardens, Cleaners, Messengers)	
	Facility Management (including Craftsmen)	
	Procurement Office	
	Campus Police	
	Clinic	
	Total Number of Administrative Staff	**225**

*Data from registrar office and Human resource as of Oct. 2014

History

The Ethiopian Institute of Architecture, Building Construction and City Development is a governmnet institution under the Ministry of Education (MoE) with an agreement signed with the Ethiopian Ministry of Urban Development, Housing and Construction (MoUDHC). It was officially inaugurated on March 6, 2010. It is the latest chapter of a long and vivid history of the school. Before becoming EiABC, the school was part of the Faculty of Technology of Addis Ababa University. And before that, it was known as the Ethio-Swedish Institute, or in short: the Building College. This institution was founded in 1954 through a bilateral agreement between the Ethiopian and Swedish Governments. The initial educational scheme, launched in 1955, aimed to offer a three-year diploma program in Building Engineering. At the end of the 1957/58 academic year, the training was upgraded to a four-year program leading to a B.Sc. Degree in Building Engineering.

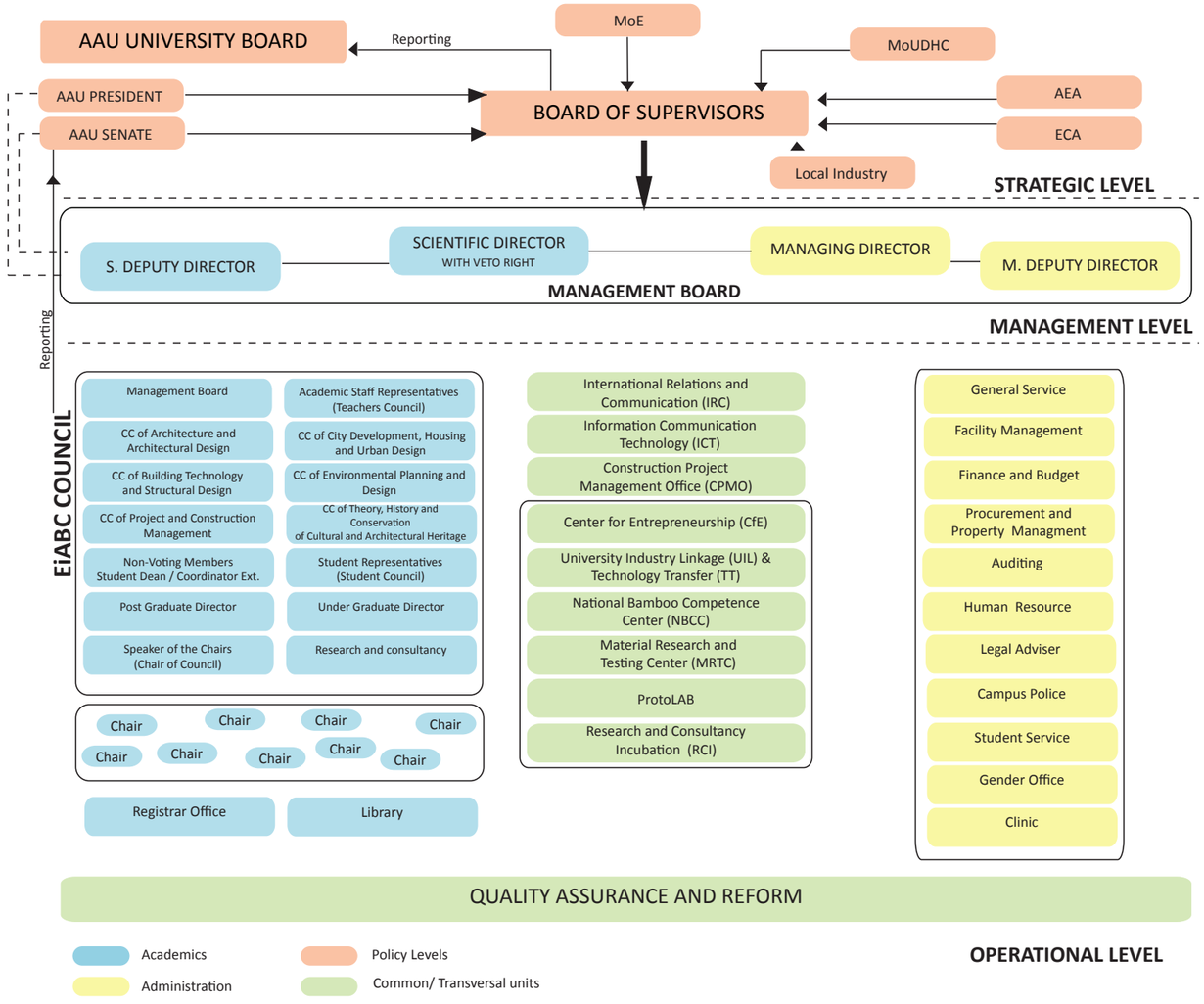
As a result of recommendations made at various times, especially those of the Presidential commission in 1968, and the report of the Technical Survey Team of 1969, the Building College and the College of Engineering merged to form the Faculty of Technology, which served under Addis Ababa University from 1969 up until the end of 2009.

Today, EiABC is an autonomous and self-administered institute under the umbrella of Addis Ababa University. Autonomy is applied in the fields of academic freedom, finance, and administration. EiABC is governed by a Scientific and Managing Director while its highest decision making body is the Council, being controlled by a Supervisory Board. EiABC offers teaching programs on Bachelor, Master and PhD level, all related to the built environment and designed in close consultation with the building industry in Ethiopia.

Organizational Strength

As a new Institute of Technology, EiABC operates as an autonomous unit under Addis Ababa University. It is accountable to its Supervisory Board and the university at large. The various units in the organizational structure are separated into three levels: First, the strategic level (including the Ministry of Education and the Supervisory Board as EiABC's strategic leadership); second the management level (consisting of the EiABC's Directors); and finally the operational level (made up of all academic and administrative units that are accountable to EiABC's Managing Board and Council).

For the first time in Ethiopia, an academic chair system was introduced as the smallest operating unit of the institute. The chairs are highly specified groups of people, which are responsible for teaching, research and consultancy activities. This structure is designed to establish direct linkage to the industries, the business sector and the public sectors. Strategic initiatives, competence centers and networks encourage cross-disciplinary cooperation. The administrative organization is centered around heads of service groups, which work hand in hand with each other and the Managing Director. Auditing and quality assurance units are placed to guarantee an effective and stream lined administration process at EiABC to support students and academic units.



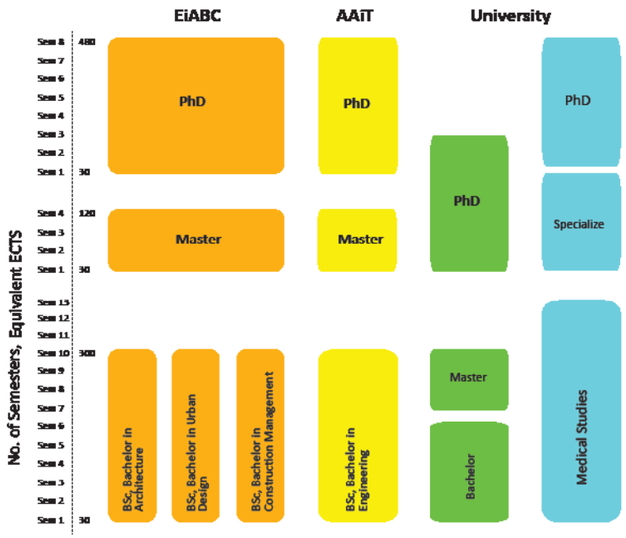
EiABC at a glance

Educating the Future

All programs at EiABC are closely linked to the current needs of Ethiopia to advance capacities in the building sector. Therefore, the curricula, as well as all research and consultancy activities of EiABC, reflect the requirements of a developing nation. All Bachelor programs involve external internship training components to orient all academic activities towards an applied and practical teaching and learning process. The combination of a solid scientific training and a practical application guarantees that EiABC graduates are adequately equipped for an increasingly growing building industry in Ethiopia.

EiABC offers accredited study program by the senate legislation of Addis Abeba University recognized by the Ministry of Education. EiABC took part of higher Education reform internationally compatible with the ECTS (European credit transfer System.) The Bachelor of Science is a 5 year degree (300 ECTS), followed by the Master degree of 2 years (120 ECTS). The PhD program take three to four years with a thesis defense and original research.

Continuing and extension education programs offers practitioners the opportunity to study next to their professional commitments and to broaden their academic capacities.



*Some qualifications might have exceptions from the above stated diagram.

Foundation	1953 as Building College
Inauguration EiABC	2009 as Ethiopian Institute of Architecture, Building Construction and City Development
Academic Programs	**Bachelor Programs** B.Sc. Architecture B.Sc. Urban & Regional Planning B.Sc. Construction Technology & Management **Master Programs** M.Sc. Environmental Planning & Landscape Design M.Sc. Housing & Sustainable Development M.Sc. Urban Design & Development M.Sc. Advanced Architectural Design, MAAD M.Sc. Construction Management (coming soon) M.Sc. Preservation & Conservation of Historical Buildings & Sites (coming soon) **PhD Programs** PhD Environmental Planning PhD Urban and Regional Planning

Academic Commitment

EiABC is a home for architecture, urbanism and construction technology and management. It educates prospective graduates, provides knowledge and services to the industry, and develops skills in design, building technology, management, and planning. It conducts technology-based applied research and consults with public as well as private partners. of EiABC are highly trained to this aim and are employed in academic, research, and practical oriented positions.

SRDU: Sustainable Rural Dweling Unit

Of the estimated eighty million people living in rural regions of Ethiopia, approximately 80% are living in housing units that are substandard and inadequate. Although this dire situation requires an immediate intervention and systematic improvement, both academics and policy makers still largely neglect the issue; of witness, the United Nations' Millennium Development Goal, target-11, that focuses on urban slums only. Observing this gap, a research project was initiated at the Housing Chair of the Ethiopian Institute of Architecture, Building Construction and City Development (EiABC). It is entitled Sustainable Rural Dwelling Unit (SRDU) and focuses on capacity building for the construction of improved housing units with the use of alternative building materials and renewable energy.

The research project is designed in three phases: Phase- 1 dealt with the documentation and study of the existing rural housing and the construction of SRDU-I, Phase-2 dealt with the construction of SRDU-II, and Phase-3 deals with the up-scaling of the SRDUs and the contextualization of vocational training, hereafter SRDU-III. As of now SRDU-I and II are completed, while SRDU-III has just been launched. SRDU-III aims to address a key challenge in the promotion of improved innovative housing which is ensuring the final acceptance of the innovation by a wider population. Frequently, projects are prone to remain as one-time interventions, short of dissemination.

Intermediate findings of the research indicate that carrying out hands-on training of trainers (TOT) to farmers, recruited from different parts of the project area, is one of the key methods for sustainability and scaling-up. To enhance this further, the main focus of SRDU-III will be mainstreaming the learnings, so far gained, through the development of curricula and the creation of a capacity building pyramid involving local universities and TVET colleges. The key strategies for capacity building, thus, will be curriculum development and hands-on training that takes into consideration indigenous knowledge and socio-cultural realities. Scientific research is expected to be provided by PhD candidates from ETH-Zurich of Switzerland and EiABC through the professorial guidance at both the ETH-Zurich-Future Cities laboratory in Singapore and EiABC. The SRDU research project, when up-scaled, is believed to have an impact, not only on the efficiency of rural settlements, hitherto scattered; but also on the health, education, job creation and generally the wellbeing of the inhabitants of Ethiopia's emerging towns and the rural areas.

Sustainable Rural Dwelling Unit (SRDU)
The issue of rural housing is largely neglected, even by the Millennium Development Goals charted by the United Nations Habitat program. This dire situation calls for an immediate intervention for systematic improvement. EiABC takes on the initiative and introduces a research stream which aims to contribute towards the improvement of the rural housing in Ethiopia.
Responsible Chairs: *Chair of Housing*
Research Team: Dr. Elias Yitbarek Alemayehu, Berhanu Gebrewold Genjebo,Meron Kassahun Asfaw, Melakeselam Moges Mengistu, Denamo Addissie Nuramo, Yohana Eyob Tefera, Yidnekachew Tesmamma Daget,

Pioneering Research

BURANEST: Model Town Construction in Amhara Region

Momentarily, numerous help organizations such as the Danish Refugee Council (DRC), the UNHCR, US-AID, and many others are providing more than 300.000 refugees shelters on Ethiopian territory. With regard to the political and economical situation in neighboring counties, a drastic increase of this number is expected in the coming years.

Refugees lost their habitual residence, “owing to well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion.” (UNHCR) By the end of 2009 over 15 million people were classified as refugees. 80% are currently to be found in the developing world, demanding refugee shelter construction to be low cost but at the same time to fulfill minimum human, social and therefore architectural standards.
Refugee camps are a settlement phenomenon with multidimensional aspects of organization construction methodologies, technical, functional and social infrastructure requirements, and environmental as well as economical constraints. Usually, the camps are large-scale semi-urban structures and represent an evolution of different building typologies, which over time develop from a short term emergency response to a transitional shelter evolving subsequently into a permanent architectural structure. So far, the average duration time of refugee residence is more than 20 years in Ethiopian camps.

Following these premises, EiABC engaged with DRC and UNHCR into a research project to develop appropriate transitional shelter proto-typologies, which have the capacity to be upgraded to permanent structures. Aspects of project implementation such as local available materials, logistics, economic aspects, construction processes, capacity building possibilities, and construction manuals are researched and tested in full scale at EiABC campus with three different typologies: a sandbag shelter, recycling empty food bags and soil, a bamboo structure shelter using local growing bamboo as a sub-structure to be covered in various material, and a shelter constructed with stone gabions, making use especially of the rich capacities in the northern part of Ethiopia. All typologies follow the premise to use local available materials and basic know-how to construct such shelters.

UNHCR / DRC Refugee Shelter Research Project
Momentarily, numerous refugee and help organizations such as the Danish Refugee Council (DRC), the UNHCR, US-AID, and many others are providing more than 300.000 refugees shelters on Ethiopia territory. With regard to the political and economical situation in neighboring countries, a drastic increases of this number is expected in the coming years.

Pioneering Research

SCALING DOWN

Through the “Welcome to Africa” program, and executed by three Universities, from Ethiopia, Germany and South Sudan, the general aim of this research cooperation is to strengthen the collaboration in practical research and experiential learning, to bring together contemporary building technologies with real contextual circumstances within an academic learning scenario.
The project includes the realization of three experimental prototypes in scale 1:1 in the years 2011-2015, with the objective to propose alternative housing typologies, which are affordable, livable, flexible and sustainable with the appropriate construction details.

PROTOTYPE I – SECU: MATERIAL AND BUILDING PARAMETERS
In 2012 the first material oriented building prototype SECU - Sustainable Emerging City Unit - was realized in three months only introducing the potential of a new material in Ethiopia - highly compressed straw panels

PROTOTYPE II – SICU: BUILDING PROCESS
Sustainable Incremental Construction Unit is the second experimental process oriented building prototype which also deals with participatory design, to be done on a highly dense neighborhood of Addis Ababa in 2013. The SICU project is projected as a parallel strategy to the existing governmental housing project by researching and implementing innovative and cost efficient constructions and materials. It predominantly uses fast and simple prefabricated construction, which will undoubtedly influence the economic status of the society both by introducing a new way of building system, as well as creating the opportunity for new types of skills and jobs.

PROTOTYPE I – MACU: TECHNOLOGY ORIENTED BUILDING
Mobile Automated Contemporary Unit is the third experimental, technology oriented building prototype which deals with integrating new digital planning and manufacturing techniques into participatory design for the case of highly dense neighborhood of Addis Ababa and emerging country like South Sudan. The aim is to develop such a small scale parameterized modular housing strategy which is flexible enough to suit the local needs of both - Ethiopian and South Sudanese project partners. It will be a show case where the team of students with their tutors will research and explore possibilities of designing and realizing a flexible housing unit as a 1:1 prototype.

Responsible Chairs: Chair of Building Construction, Chair of Architecture and Design I
Partner Universities: Bauhaus University Weimar, Juba University
Research Team: Dirk Donath, Brook Teklehaimanot, Helawi Sewnet, Sarah Abdulhafiz, Belay Getachew, Jakob Mettler, Timo Riechert, Emanuel Longomiya, Peter Dissel, Karsten Schlesier, Ingo Oexmann, Florian Geddert Martin Bielik, Nicole Baron, Carsten Stammeier, Joern Schultz

Pioneering Research

EBE: Experiment on Building Envelopes

The so-called EBE or Experiment on Building Envelopes is an international teaching workshop conducted by The Chair of Architecture and Design I / protoLAB in collaboration with AKT II from UK, Sebastian Behmann from studio Olafur Eliasson Germany and Julia Mauser Architects from Germany.

The thematic focus of EBE was to explore facade alternatives for the city of Addis Ababa which are environmentally conscious and culturally sensitive. Three fundamental phases were identified in this research: The Artistic phase, the Digital phase and the Building phase.

In the artistic phase, the SUN was introduced as a design tool and students started experimenting with intended effects of shadows both on interior and exterior spaces. Prototypes were made with different materials to study effects of the generated shadows. Conceptually, a basic design intention was defined at this stage. The second digital stage dealt with how to integrate a basic program and digitally simulate the desired effects with parametric softwares such as grasshopper.

The third and final phase of the research was focused on choosing appropriate materials and testing these materials by producing mock-ups. Seven finalist ideas of skin proposals were built in a 1:1 scale at the protoLAB and later on Displayed to the public.

Responsible Chairs: Chair of Architecture and Design I,
Project Partners: AKT II, Studio Olafur Eliasson, Julia Mauser architects
Research Team: Brook Teklehaimanot, Lulit Solomon, Sarah Abdulhafiz, Assefa Gebrekidan, Adiam Sertzu, Jeroen Janssen, Julia Mauser, Sebastian Behmann

Pioneering Research

EthioPlug-in Add on library Research

Ethiopian heritages: past, present and future
(Preparation of tools in digital media for aiding development of Ethiopian attributes in the design world)

Ethioplug-in research is a ground-breaking initiative to digitalized and provide widespread access to the Ethiopian architectural history. Through conducting this research we intend to look back to our architectural heritage and trace its significance to the development of the local industry. Many attributes of our historic design have the potential to predict how Ethiopia's design landscape evolves in the future. Over and above capturing the history, the project's main goal is to provide widespread digital access to Ethiopian unique architectural and construction details, furniture and utensil design, house designs, textures, patterns and even indigenous plants through specialized software applications.

This research intends to parameterize the traditional architectural details, construction techniques, furniture, utensils, and document them and expose them through the intended plug-in. The components are parameterized so that users can have the capacity to transform them towards their design goals.

The provision of Ethiopian design tools in digital media, in a parametric (transformable way) will encourage local and international designers to consider the potentials of the local techniques and challenge these attributes to represent the future. This scenario will ultimately affect the design and construction industry of the country both locally and internationally.

Responsible Chairs: Chair of CAD and Geo-informatics, Chair of Heritage
Research Team: Ayele Bedada Melat Aseffa-Dr. Heyaw Terefe - Mengist Berhanu , Florian Stall

Gebrekidan Getaw Kirubel Nigussie, Shalom Lemma, Lemi Belete, Ermiyas Tessema, Orion Lemma, Liuel Hizikiyas, Beniyam Eshete, Benyam Shimeles, Andualem Bekele, Simon Mucheye, Yosef kassa, Matias Fekadeselassie, Michael Bekele, Hermela Mulat along with the entire 2010 and 2011 entry architecture students.

-> www.eiabc.edu.et/EthioPlug-in Add on library project

Pioneering Research

From CLUVA to WGA

WATER RESILIENT GREEN CITIES IN AFRICA

The general objective of the research is to explore water resilience by using urban green infrastructure as a climate change adaptation strategy in flood and drought prone cities, using Addis Ababa and Dar es Salaam as cases. Partner teams have been established within three fields of study: green space, water management and institutional analysis. To conduct interdisciplinary research and reach integrated strategies and solutions, researchers have been appointed to work across fields. Six PhD students have been enrolled and are developing projects across the main research fields. To understand and link conditions and overall problems in the cities with specific local conditions and options for solutions, the project works at different scales: city, catchment and site scale. Common criteria for selection of case catchment and pilot sites have been developed and a case catchment with upstream, midstream and downstream pilot sites have been selected for both cities.

3 partners 2 case cities

The project is conducted jointly by: the Institute of Human Settlements Studies (IHSS) at Ardhi University, Tanzania, the Ethiopian Institute of Architecture, Building Constuction and City Development (EiABC) at Addis Ababa University, Ethiopia, and the Department of Geosciences and Natural Resource Management (IGN) at the University of Copenhagen, Denmark. The project will be implemented in close collaboration with representatives from the city administrations and selected communities in the two case cities, Addis Ababa and Dar es Salaam.

Expected results

Using green infrastructure for climate adaptation of cities is an emerging phenomenon in academia and in the policy making arena and its feasibility in developing countries is under-researched. The project will therefore create new knowledge and understanding in this field. New knowldege will be disseminated among academics, policy-makers and other stakeholders by academic papers, workshops and newsletters throughout the project process. It is anticipated that research can leap-frog the real-life development of urban water services in the two case cities via pilot projects that actively engage stakeholders. Besides, the six PhD students and a new master course will be direct outcomes of the project, which will further the knowledge in the context of African cities.

Pioneering Research

Thematic research on environment

The general objective of the Thematic Research is to devise a strategy that will enable create efficient and sustainable, clean and healthy, green and pleasant, hazard resilient and well-managed urban areas in Ethiopia with integrated socio-economically viable and environmentally friendly urban agriculture and food system through sustainable urban environmental planning, introduction of state-of-the-art and locally available environmental technology and enhancing governance / management capacity.

The specific objectives are:
1. To develop integrated approach to the planning and management of land resources in urban areas through landscape analysis for the purpose of urban growth planning and to preserve crucial ecosystem functions and production potential; (STR1).
2. To assess the status of the present urban water resources planning and management and to design feasible strategies for sustainable integrated water resources utilization (STR2).
3. To explore the use, functions and livelihood activities and the planning and management aspects of urban green infrastructure and identify opportunities and barriers for integrating green infrastructure in urban development planning (STR3).
4. To explore and analyze the present waste and pollution management system and to develop efficient and effective waste management strategies on the basis of combination of state-of -the –art and locally available technologies. (STR4).
5. To identify areas prone to environmental hazards and propose mitigation planning and management options (STR5).

The TR will engage both PhD and MSc students. The knowledge gained from the TR will be disseminated through PhD and MSc-level courses, policy recommendations, and research articles.

Pioneering Research

Collaborative projects lead to joint international lab

1. BAUHAUS EMERGING CITIES LAB- ADDIS ABABA (ECL-AA): Is a joint institution for Research and Technology Exchange in the field of building construction, architecture, urban and environmental planning of the Bauhaus University Weimar, Germany, in collaboration with the Ethiopian Institute of Architecture, Building Construction and City Development (EiABC) at the Addis Ababa University (AAU) in Ethiopia. It is the consequence and next step of the existing strong collaboration between these two institutions expanding the current boarders of the two institutions based on the signed memorandum of understanding between the two parties in 2010 (extended May 2014). The established institution is an integral part of both joining parties, the EiABC at the Addis Ababa University and the Institute of Experimental Architecture at the Bauhaus University Weimar to achieve the model role for both countries for international collaboration in research and education.

2. **EMERGING CITIES INTEGRATED PLANNING LABORATORY (ECIP LAB):** The project responds to the lack of planning and research on small towns and aims to develop, from one side, research capacities within the EiABC and, from the other side, to create a multidisciplinary planning laboratory that will operate as an interface between academic researchers, decision-makers for small town planning and local communities. So, first of all, in order to strengthen the capacities of the EiABC in relation to research on small town development of emerging cities in Ethiopia. The theses will have a multidisciplinary character, including social, economic, demographic, environmental components, and will thus benefit from the participation of numerous and disciplinary different research units in Belgium and Ethiopia. In Ethiopia, the EiABC will in fact participate through its Chair of Ecosystem Planning and Management, Chair of Urban and Regional Planning and Chair of Environmental Design. On the contrary, Belgian partners included in the project are the Faculty of Architecture and the Ecole Polytechnique of the ULB, and the – Biodiversity and Landscape Research Unit of the ULg/GxABT.


PLEASE

Building Ethiopia

EiABC published the first scientific architectural and urban book in Ethiopia titled ''Building Ethiopia: Sustainability and Innovation in Architecture and Design". Building Ethiopia attempts to record and document the prominent ideologies, approaches, and discoveries of its time within the disciplines of the built environment. It is intended to create a link between the academia, practitioners and decision makers of the building sector, as only the integration of these three actors will bring about the changes and innovations needed to push the construction industry forward. This publication hopes to become a medium through which further partnerships and collaborations within the respective disciplines are forged, as well as a provocative platform for constructive discussions about the NOW and the very near TOMORROW of the architecture of ETHIOPIA, which is loaded with both tremendous potentials and formidable challenges. The book was produced and edited by Helawi Sewnet and Zegeye Cherenet and contains 40 chapters by various authors.

Making

The runway catwalk scene is a fascinating performance. It is amazing to see a model: a human being on the catwalk, giving body and flesh, and life to a non-human object. The human model on the catwalk is real: breathing and walking. But it is also imitating a potential outfit for an unknown someone.

The act of modeling is very similar to acting in a play. Acting is a performance, the mimicry of life and personalities but modeling is mimicking the future of a piece of cloth, a prototype. But to do this, the runway model also has to act the persona that the outfit is suggestive of.

I see two sides whenever a runway model is on the catwalk. In one sense, I see a person, I see beauty and glamour. In another, I see a dress, a persona defined to fit the character of the dress. These two alternating perceptions are important for me as it proves the power and strength of a model, which is a form of a prototype utilized for display; It literally explains that a model/ prototype lives in its own domain. This book is interested in prototypes. Not just in prototypes as what they stand for, but also in prototypes as they themselves are: their material, form, shape, color and artistic associations.

The Materials Research and Testing Center (MRTC) is one of EiABC's core units. MRTC participates in the advancement of technical education, renders investigative/ test services to the whole of the infrastructure sectors on construction materials and foundation soils. The main focus is to assure sustainable, safe, economical and eco-friendly materials. The MRTC is highly dedicated to quality technical education, excellence testing and consultation services, excelling customers expectations with affordable prices. This can be achieved by the newly commissioned, professionally committed, well- educated and highly experienced management team along with the recent availed high-tech construction materials and soils laboratory and field investigation equipments.

The MRTC has been serveing the nation, already well over fifty five years, in teaching, research and testing of building materials and soils. Its main mission is to be the center of excellence in this part of East Africa by conducting advanced building materials and soils research as well as providing specialized tests. Moreover, in its commitment to higher education, MRTC assists the technical human resource development of EiABC in educating highly competent architects, urban designers and planners and construction technologists in close cooperation with the Chair of Construction Materials and Geo-Techniques.

Two sectors of the Materials Research and Testing Center provide valuable investigative and test services to the construction industry:

1: Construction Material Section (CMS)
The section renders both destructive and non-destructive tests. The non-exhaustive range of investigation and test services are on: cement, sand, crushed and non-crushed aggregated, concrete, fired bricks, concrete pipes, etc. For all investigation and test results the MRTC issues valued result certificates.

2: Foundation Soils Section (FSS)
The section avails field and laboratory investigation and test services for the whole range of engineering properties of the soils. The non-exhaustive ranges of services being provided are sieve and hydrometer analysis, liquid and plastic limits, permeability, direct and indirect shear, free-swelling, swelling pressure, field density, etc. For all investigation and test results the MRTC issues valued result certificates.

Material Research and Testing Center (MRTC)
The restructured MRTC has been serving the nation already well over fifty five years in teaching, researching and testing of building materials and soils. Its main mission was and still is to be center of excellence in this part of Africa by conducting advanced building materials and soils research as well as providing specialized tests.

Responsible Units: MRTC Management with Chair of Construction Materials and Geo-techniques

-> www.eiabc.edu.et/mrtc

Industry Cluster

CENTER FOR ENTREPRENURSHIP

There are mutually reinforcing four major areas in the scope of CfE: education of students, TOTs, coaching of young entrepreneurs, research and needs assessment. Students, being the primary customers of the institute, benefit from the center in various ways. Firstly, by working with the Chair of Entrepreneurship, the Center ensures the extent to which relevant entrepreneurial knowledge, skill and attitude are embedded into the general curricula, beyond just the Entrepreneurship Courses. Secondly, students benefit from needs based trainings and different events envisaged to be organized on selected entrepreneurship topics.

The Center for Entrepreneurship (CfE) has been established with the following general objectives:

- To create awareness of needs and potentials of entrepreneurship among EiABC community
- To promote an entrepreneurial culture and change of mindset
- To address the gap between higher education (academia) and industry
- To create a supportive environment for entrepreneurship development at EiABC
- To provide Business Development Services (BDS) including training, consultancy and advisory services, marketing assistance, information, technology development and transfer, and business linkage promotion.

The Main Tasks of CfE are to: Lead and coordinate events/trainings initiated by CfE and the Industry Cluster; Oversee and assist with participant screening, training, matching, support, supervision activities for training and consultancy; Support the Institute and the center on fundraising activities; Support build up entrepreneurship competencies at EiABC (students and staffs); Organize orientation sessions that outline goals; procedures and events for students and staffs; Give practical advice to students and community; Identify technological demands through industry mapping and communicate with all chairs in order to estimate the opportunities; Participate in analyzing technology transfer mechanisms in order to help the institution and the community, In collaboration with TTO; Develop appropriate technological research and consultancy services based on the prioritized demand; and disseminates the developed technologies.
Furthermore, the center coordinates, plans and schedules events, follow-up meetings, reports and demonstration programs. It links the industry cluster and maintains strong relationships with people, stakeholders, industries, organizations, chairs and tries to address their needs while managing data bases and undertaking documentations on Entrepreneurship and the Industry.

Industry Cluster

EiABC protoLAB

Throughout the history of Architecture, Construction and Planning, construction processes have always been defined by the tools available. These tools (both conceptual and instrumental) have played a crucial role in defining how design, planning and implementation evolved through form, material, scale and performance.

Although manufacturing through communication between humans and machines has been around since centuries, Architects and Planners have only recently discovered these endless possibilities of digital fabrication methods. It opens new ways and techniques of representing the reality by creating various models of it, which can be created, explained and changed in a minimum amount of time and resources, thus to develop different models and possibilities to choose from.

The EiABC *protoLAB* – which was officially inaugurated in December 2010 – alternates through hands on manual technical knowhow and highly advanced digital fabrication techniques where both involve in extensive research on material behavior, structural systems as well as production methods. EiABC protoLAB stimulates, promotes and involves participatory design and production with such tools as Laser cutter, 3D printers at its disposal. It promotes a shift towards customization of design methods through development of mathematical logic (integrating algorithms and dynamic formulations in the project – design process itself) or skillful fabrication techniques. With these latest generation of machines available, material production, computational design and manufacturing techniques are all explored together with our partners and clients in the industry. The EiABC *protoLAB* serves students, faculty, and also industrial companies in any field related to digital design and uses the technology and workshop facilities available to produce two as well as three dimensional works and prototypes at their request. It also provides seminars varying from tutorial sessions on how to use the machines or prepare digital files, up to intensive design and research consultancies in which the EiABC *protoLAB* will focus on specific topics.

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Responsible Units: *protoLAB with Chair of Computer Aided Design and Chair of Architectural Design*

-> www.eiabc.edu.et/EiABC Proto LAB

Industry Cluster

NBCC Bamboo research

The fact that bamboo offers many advantages that fulfill most of a sustainable material, especially as a substitute for timber signifies the need to research on the possibilities of using it in the Ethiopian construction industry. In September 2012, the Chair of Appropriate Building Technology at EiABC has established a National Bamboo Construction Center (NBCC) in the premises of EiABC. The center has a physical address where information about the potential uses bamboo of as a construction material can be accessed and research is conducted. Extensive research, documentation, training and promotion are some of the activities carried out by the center. The center has a vision to make bamboo a standardized construction material in Ethiopia.

The center has core research team and it has the following main core activities: Design Documentation, Student's ClubConstruction & Materials Testing.

Bamboo-Research at EiABC
Bamboo is a re-growing building material made in Ethiopia. It is appreciated for its natural appearance, its fabrication is environmental friendly and it can be harvested in a three to six year cycle.
Responsible Chair :chair of Appropriate Building Technology
Research Team: Denamo Addise,

Industry Cluster

University–Industry Linkage (UiL) and Technology Transfer Office

The UiL and TTO units in the Industry Cluster are set up to create a network and facilitate Communications between industries and EiABC. Through these offices, EiABC can embark on various endeavors for career development, curriculum improvement and in turn steer the economy via technology transfer.

The overall objectives of the UiL and TTO are the following:- to Coordinate and organize measures for career development; To identify projects applicable to the institute; To liaise between the institute and the industries, the industries and the students and the institute and the students; to implement a qualified internship system; To organize workshops seminars and trainings with respect to EiABC functions and mandates; To advise the scientific director and the managing director with respect to networking activities between the institute and the industries; to implement a sustainable technology transfer system as an essential part of the EiABC's work.

There are two major services provided by UiL. The first service is the research aspect, particularly by closely working with TTO, MRTC, CfE and Research, Consultancy ad Publication Office. Secondly, it facilitates the compulsory Qualified Internship System (QIS) by closely working with the respective Chairs. On the contrary, the TTO focuses on promoting projects and researches that have potential commercial interest and can support business start-ups and maintain the communication between EiABC and the Industry.

Set up within EiABC as structured by ecbp / University reform within the EiABC, together they are responsible for the Implementation of the new internship system; Acquiring and counseling companies and respective organizations; Communicating between industry and the institute on internship project development and Technology transfer; Building capacity within departments regarding mentoring / evaluation; Maintaining database/data bank for internship; Providing enough internship opportunities for each student; Holding close contacts with other institutes and Universities; Effecting an overall promotion development; Inviting the industry and the local economy for workshops, seminars and lectures; Searching for funds, and if found, administrating them; Integrating other faculties (interdisciplinary networking); Establishing student counseling services within EiABC; Coordinating students/interns as a supporting team for career development and, last but not least, generating development & practice oriented professionals from the institute.

University-Industry Linkage

University-Industry Linkage refers to the relationship by which academic activities are linked with similar ones in the industrial sector. With the program, EiABC wants to become a trustworthy and attractive partner for the industry in Ethiopia.

-> www.eiabc.edu.et/Technology_transfer
-> www.eiabc.edu.et/university-industry-linkage

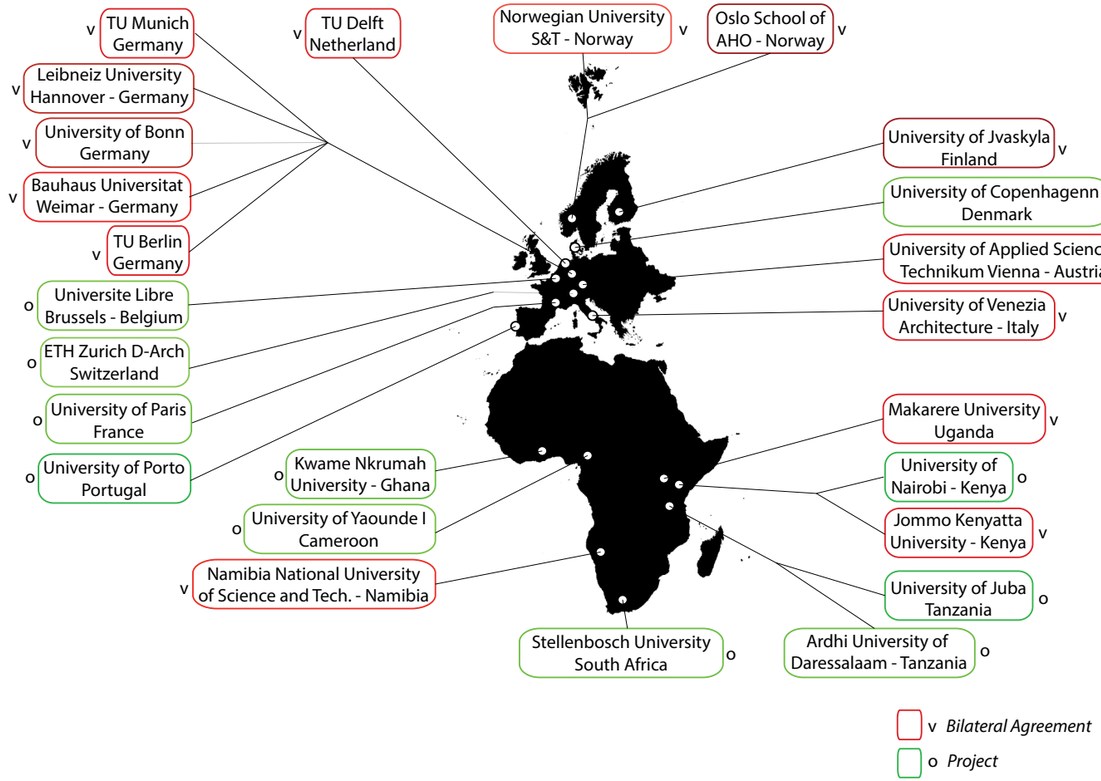
Partnerships

Strategic partnerships of EiABC

Its research with a clear applied focus makes EiABC an interesting Partner for academia and industry nationally as well as internationally. Worldwide, EiABC is linked to numerous academic as well as research institutions and is part of a global network in student exchange programs.

Several research projects and collaborations were formed over the last years, such as the on going Welcome Africa or the recently signed Memorandum of Understanding with Delft University of Technology. In these relations alone, EiABC is networked with more than four universities worldwide. These agreements are based on exchange of academic staff and students, joint research projects and training programs, as well as the implementation of strategies for academic and international development. With it's Urban Laboratory testing site, launched in 2009, EiABC actively brings together industry and business partners to stimulate new construction models for Ethiopia. Combined with a new focus on entrepreneurship, these construction models can easily be adopted by young graduates from the Institute to allow new business models to unfold in the building industry.

EiABC is a member of these **International Networks** and **Organizations**
- DAAD
- GIZ
- AIESEC
- UN HABITAT
- Tuning Harmonization Network
- AfREs (African Real Estate)
- Archi African Educational Network



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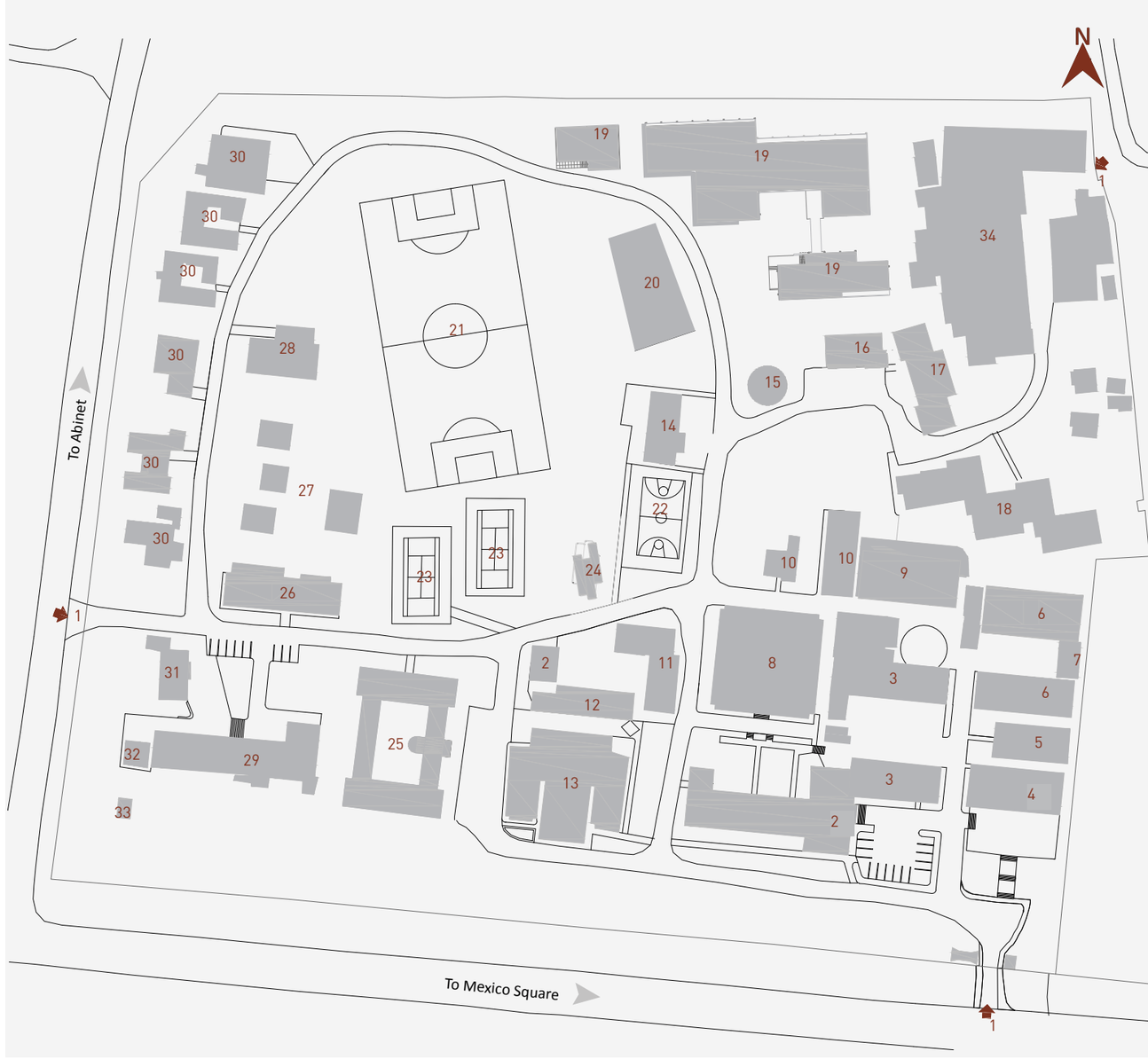
Life at EiABC

As a leading educational Institute for science and technology, EiABC campus offers numerous facilities and plenty of possibilities for a rich university life.

EiABC campus, with its numerous historical buildings very green environment, offers researchers and students a professional infrastructure and attractive working conditions. Numerous sport facilities and cafeterias provide lively meeting places and cater for the staff and student's physical well-being. Social clubs and associations for students, staff and EiABC graduates make starting life at university and a professional career easier and enhance interactions with people of common interests.

Laboratories and testing centers provide professional services to the outside community and enable strong links to the industry. Physical as well as digital libraries ensure high quality research and provide spaces for individual studies and knowledge production. Dormitories guarantee an intensive and concentrated academic atmosphere with short distances and lively exchange among students and staff. It is the conviction of the Management Board, that only through a clean, organized and well maintained environment, productive and efficient operating units can guarantee a perfect teaching and learning environment for staff and students.

1 Gates
2 Dean's Office, Dept.of Architecture & Urban Planning, Dept.of Building Technology, Classrooms & Soil Laboratory.
3 Material Testing Department
4 Swedish Pavilion
5 Staff Offices, Classroom
6 Workshops
7 Office
8 Library
9 ProtoLAB
10 Administration
11 Registrar Office, Classrooms,Extension Office
12 ICT, Classrooms And Kitchen
13 Dormitories, Cafeteria and Clinic
14 Student Lounge
15 Tigray House
16 Staff Offices
17 Store
18 Dormitories And Dean Of Students
19 New Extension Classrooms And Offices
20 Swimming Pool
21 Football Field
22 Basketball/ Volleyball Field
23 Tennis Courts
24 ice Addis
25 Urban Building, Masters And Ph.D. Offices
26 Animal House
27 Urban Laboratory, SUDU, SECU, SICU
28 Competence Center
29 Institute Of Pathobiology
30 Staff Residences
31 Garage
32 Lounge
33 Greenhouse
34 Furniture Workshop



Local Agenda 21

Local Agenda 21 is a thematic research that has been successfully launched in EiABC

The new thematic research titled “Improving resource efficiency, environmental quality and sustainability of urban areas in Ethiopia”, addresses a national priority problem and creates a synergy between research and graduate teaching, and is conducted in collaboration with other institutes of Addis Ababa University.

This agenda focuses on how EiABC could contribute to the Ethiopian development strategy and how to cultivate, in the meantime, a sustainable development. EiABC Agenda 21 is a blueprint for environment and development in the 21st century- to its campus, and the first of its kind in Ethiopia.

Local Agenda 21 provides a framework for institutions and their stakeholders in order to implement the concept of sustainable development (materialize, concretize). “21” refers to the 21st Century. It has been affirmed and modified at subsequent United Nations conferences. The term “Agenda” is to be understood as an Action Plan program. It must, according to the principles of sustainable development, be harmonious and respect the 4 pillars “ecologic, economic, social and cultural pillars”. It should be livable, realistic and equitable”. The local Agenda 21 has to help the country give local answers to five main global problems:

1. Climate change and protection of the atmosphere,
2. Preservation of biodiversity, environment and resource,
3. Development of all human beings access to a good quality of life,
4. Social cohesion and solidarity between territories and generation and
5. Dynamic development of the following modes of production and responsible consumption.

EiABC will follow a methodology to implement its own Agenda 21, based on a wide participation of EiABC students, administrative and academic staff. Agenda 21, at EiABC, is a project to make VISIBLE and SUSTAIN what we are doing every day. EiABC wants to contribute to strengthening the awareness of each stakeholder and make the sustainable developments of the research, the innovation, the education of all the students and the well-being of its staff rational.

Dr. Hailu Worku
Chair of Environmental Planning & Landscape Design

Student Council

EiABC students constitute not only the most vital component of the institute, they are the mere reason why EiABC is in existence. To channel and voice their interests, comments, concerns, and suggestions, EiABC established, since it`s start in 2009, a strong and active Student Council. The Student Council is a representative body composed of student representatives from each batch and program, chosen by their respective classmates. Therefore, the Student Council represents the largest interest group of EiABC and is acting to their advantage. Two members of the Student Council have a seat in the EiABC Council, the highest decision making organ of EiABC.

Next to the representative character of the Student Council, it also organizes social and extracurricular activities such as the Social Clubs, the Environmental Days at EiABC, the Best Teaching Award etc. The Student Council works in very close collaboration with the Dean of Students in terms of provision of dormitory space and food, establishes rules and regulation for a social and fair student community, is part of discipline committees, helps freshman students with their orientation, and therefore acts in a social, ethical, democratic and transparent way to the benefit of all students of EiABC.

EiABC has a long tradition of self-organized student clubs. The clubs are supported by the Managing Board of EiABC and are a very important part of an active social community. All Students are asked to join these clubs and become active members in organizing them.

Extracurricular Activities

Extracurricular Activities are a vital part of an education, keeping the campus alive and maximizing the exposure of a student to different aspects of university life. Students are therefore encouraged to participate in and create various extracurricular activities in the campus. Activities ranging from participating and being a part of student clubs to organizing events and workshops, take place in EiABC.

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In addition, the EiABC student voice is the first student-developed and student-run radio station in Ethiopia. It introduces an alternative to mainstream radio stations in the country by having a strong focus on capacity building and knowledge sharing. The goal of the station is not only to supplement the regular course materials for the students of EiABC and to create a stronger feeling of unity, but also to strive for a wider access of knowledge amongst the general public. EiABC student voice is not a profit-seeking medium and currently has around 40 dedicated volunteers that help developing and running the regular programs.

The EiABC family

Academic Staff

Abel Seyum, Abiy Tesfaye, Abnet Getachew, Abnet Gezahegn, Abraham Workneh, Addis Yohannes, Addisalem Feleke, Adeyabeba Tadesse, Ahmed Amdyehun, Alazar Assefa, Alebachew Abreham, Alemu Nebebe, Amanueal Alemu, Amanuel Getahun, Amanuel Teshome, Ameha Ermias, Ameha Tigabu, Anteneh Tesfaye, Argaw Tarekegn, Asebe Samuel, Asgedom Haile, Ashenafi Wujira, Asmelash Bekle, Assefa G/Kidan, Ayele Bedada, Aziza Abdulfetah, Bayu Getachew, Bekalu Tesfaye, Belay Getachew, Belay Yitayew, Belete Berhanu, Berhanu Gebrewold, Betel Ayalew, Bethel Biruk, Bezawerk Geremew, Biniyam Ali, Biniyam Gebru, Birhanu Mussa, Birhanu Tsegaye, Birihanu Girma (Dr.), Birihanu W/ Tensay, Bisrat Kifle, Bosena yirga , Brook Abebe, Brook T/Haimanot, Brook Tefera, Chombie Bitew, Dagim Alemayehu, Dagim Asfaw, Dagnachew Adugna, Daniel Alemayehu, Daniel Tadesse, Darik Zebenigus, Dawit Benti, Dawit Kebede, Demeke Ashenafi, Denamo Addisie, Dendena Tufa, Dereje Atomsa, Dereje Kebede, Diana Mesfin, Dirk Donath, Dr. Brook Lemma, Ebisa Tesfaye, Eleni Getachew, Eliyas Yitbareke, Ephrem Gebremariam, Eskedar Alemayehu, Estifanos Bogale, Esubalew Yeneneh, Eyasu Kumera, Eyerusalem Getnet, Eyob Girma, Eyob Wedesu, Eyob Yilma, Ezana Yosef, Faisal Girma, Fasika Sahlemariam, Fasil Giorgis, Fekadu Lemma, Fikreselassie Kassahun L, Fikresilassie Abay, Fisseha Wogayehu, Fitsum Shawel, Gemechis Tamiru, Geremew Tarekegn, Geremew Tarekegn, Getaneh Gezahegn, Gete Zeleke, Gizaw Seyoum, Habtesilassie Dejenie, Habtom Hagos, Haddis Rebbi, Hailemariam Girma, Hailu Abebe, Hailu Worku, Haimanot Seifemichael, Hayal Desta, Helom Fantahun, Henok Bayu, Henok Fekade, Hilawi Sewinet, Hiyaw Terefe, Huda Ahmed, Imam Mahmoud, Julia Mauser, Joachim Dieter, Kalkidan Asnake, Kalkidan Wudnehe, Kassa Taddesse, Kassahu Admasu, Kebede Adera, Ketema Abebe, Kumilachew Yeshitela, Kumneger Taye, Lealem Seyoum, Leslie Gottert, Leul Wolay, Leule Mebrate, Lia G/Mariam, Liku Workalemahu, Lulit Solomon, Megersa Biyena Geleta, Mekonnen Agonafer, Mekonnen Worku, Melaku Tanku, Melat Assefa, Melese Yohannes, Mengistu Birhanu, Merhawit Kahsay, Meron Kassahun, Mesfin Yilma, Meskerem Zewdie, Metasebia Tolossa, Minwiyelet Ejigu, Mistre Solomon, Mohammed Aman, Mulu Solomon, Mulugeta Adane, Mulugeta Maru, Muluken Debebe, Munir Younis, Nebyou Yonas, Neway Semunigus, Omer Awolkhair, Osman Mohammed, Petra Gruber, Pityas Teshome, Rahel Worku, Rebka Fekade, Robel Kasahun, Robel Yeshtila, Samson Tadesse, Samuel Afewerk, Samuel Tsegu, Sarah Abdulhafiz, Seid Megersa, Seid Mohammed, Semere Mulatu, Seniya Elias, Sintayew Hunde, Sisay Alemu, Sisay Deriba, Sisay Seyfu, Sisay Zenebe, Solomon Benti, Solomon G/ Hiwot, Solomon Serse, Solomon Wagaye Sime, Solomon Wolde, Solweig Kieser, Taddesse Kebede, Tadele Fanta, Tadesse Ayalew, Tadesse Gelaye, Tadesse Girmay, Taeka Haileleul, Tamirat Alemu, Tefera Desta, Tekelbirihan Kidanu, Teklehaymanot W/Senbet, Telayneh Berhanu, Tesfaye Hailu, Teshome Tefera, Tewelde kifle, Tibebu Assefa, Tibebu Tassew, Tigist Kassahun, Tsegaye Girma Tsion Lemma, Wendwossen Demerew, Wondifraw Fekadu, Wondimu Kassa, Wondweson Debebe, Wondwossen Tadesse, Wossen W/ Kidan, Woyecha Bjjiga, Wubeshet Jekale, Yalemzewd Tesfaye, Yalew Seid, Yasmin Yusuf, Yeneneh Chaniayalew, Yewbneh Getamesay, Yibelu Fantahund, Yichilal Fanta, Yidnekachew Tessema, Yihenew Birihane, Yihenew Hailu, Yohana Eyob, Yohannes Abay, Yohannes Afework, Yohannes Kassa, Yohannes Mekonnen, Yonas Alemayehu, Yonas Mekonnen, Yosef Teferi, Younas Ahmed, Yusuf Zoheb, Zekarias, Zelalem Tsegaye, Zewdu Seblework, Zewdu Tesfaye

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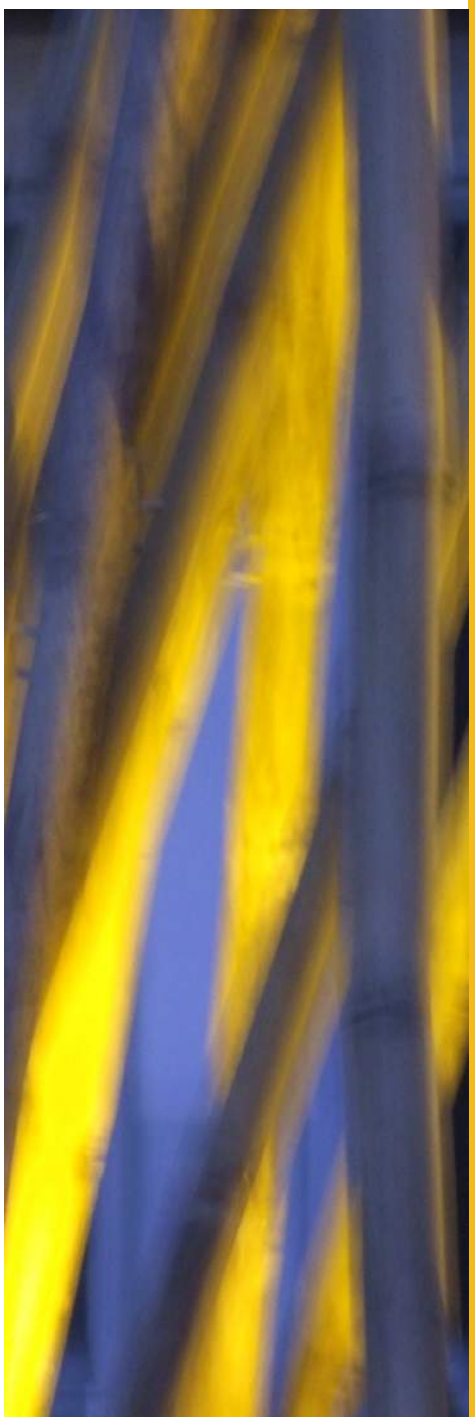

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Addis Ababa University