SHARK TANK
INSTITUTE FOR THE THEORY & PRACTICE OF INTERNATIONAL RELATIONS

Abby Bilenkin
Vincent Tandaw

WHY MICROFINANCE NEEDS MACHINE LEARNING

Roadmap

- Problem
- Machine Learning
- Solution
- Investment

over $60 billion

total invested in microfinance as of March 2015

200 million clients

of microfinance as of 2015

only 20% reached

by microfinance as of 2015

Big Problem #1:

An Incomplete Picture

Repayment rate misses the point

Wealth creation

Immediate Consumption

94%

Big Problem #1:

An Incomplete Picture

Repayment rate misses the point

Wealth creation

Big Problem #2:

Availability

Lack of on-site implementation

Complicated

MACHINE LEARNING IMPROVES MICROFINANCE

- Used in conventional banks
- Computers are better than people at reducing mistakes by 13.7%
- Neural network models technology

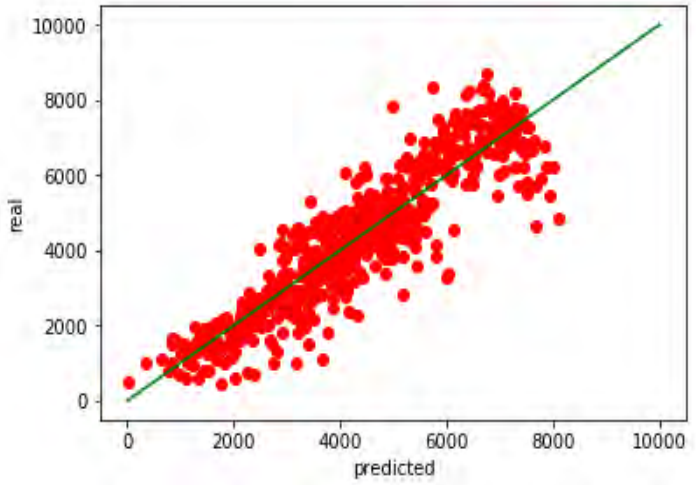
1% saved

$600,000,000

45 Seconds of Machine Learning

	F	G	H	I	J	K	L	M
	holiday	weekday	workingday	weathersit	temp	atemp	hum	windspeed
1	0	6	0	2	0.344167	0.363625	0.805833	0.160446
1	0	0	0	2	0.363478	0.353739	0.696087	0.248539
1	0	1	1	1	0.196364	0.189405	0.437273	0.248309
1	0	2	1	1	0.2	0.212122	0.590435	0.160296
1	0	3	1	1	0.226957	0.22927	0.436957	0.1869
1	0	4	1	1	0.204348	0.233209	0.518261	0.0895652
1	0	5	1	2	0.196522	0.208839	0.498696	0.168726
1	0	6	0	2	0.165	0.162254	0.535833	0.266804
1	0	0	0	1	0.138333	0.116175	0.434167	0.36195
1	0	1	1	1	0.150833	0.150888	0.482917	0.223267
1	0	2	1	2	0.169091	0.191464	0.686364	0.122132
1	0	3	1	1	0.172727	0.160473	0.599545	0.304627
1	0	4	1	1	0.165	0.150883	0.470417	0.301
1	0	5	1	1	0.16087	0.188413	0.537826	0.126548

In [54]:
```
%matplotlib inline
pl.plot(p, y,'ro')
pl.plot([0,10000],[0,10000], 'g-')
pl.xlabel('predicted')
pl.ylabel('real')
pl.show()
```



Two Part Problem, Two Part Solution

Misallocation of loans	→	Non-traditional metrics
Complicated and unavailable	→	Easily accessible medium

Who Will Care?

ACCION

FINCA®

kiva

ACDI VOCA

Expanding Opportunities Worldwide

Proof of Concept

Why is it not done?

“Niche” MFIs

Different target audience

Banking

Different target audience

Scientific studies

No scaling activities

Finances

- Stipend for two mentors
- Labor
- Travel expenses

Total: $7500

Siddharta Ghose

Data specialist at AidData

Six years banking experience

- Barclays
- HSBC

Timeline

September 2017
Obtain datasets

October 2017
Partner outreach

December 2017
Algorithm development

January 2018
Refine algorithm

March 2018
Write report

May 2018
Release project

Deliverables

Mobile site
Policy brief
Strong public relations
Rollout partnerships

Assessing the Gaps in Aid Allocation

Chris Elsner

Allie Cooper

Constraints on Country Ownership

- Gaps in Allocation
- No Metric for Accountability

Refocusing on Recipients

Data

AFROBAROMETER
LET THE PEOPLE HAVE A SAY

LISTENING TO
LEADERS

Latinobarómetro
Opinión Pública Latinoamericana

AIDDATA
A Research Lab at William & Mary

Approach

Step 1 - Adapt SDG coding methodology

Step 2 - Map demand for the SDGs

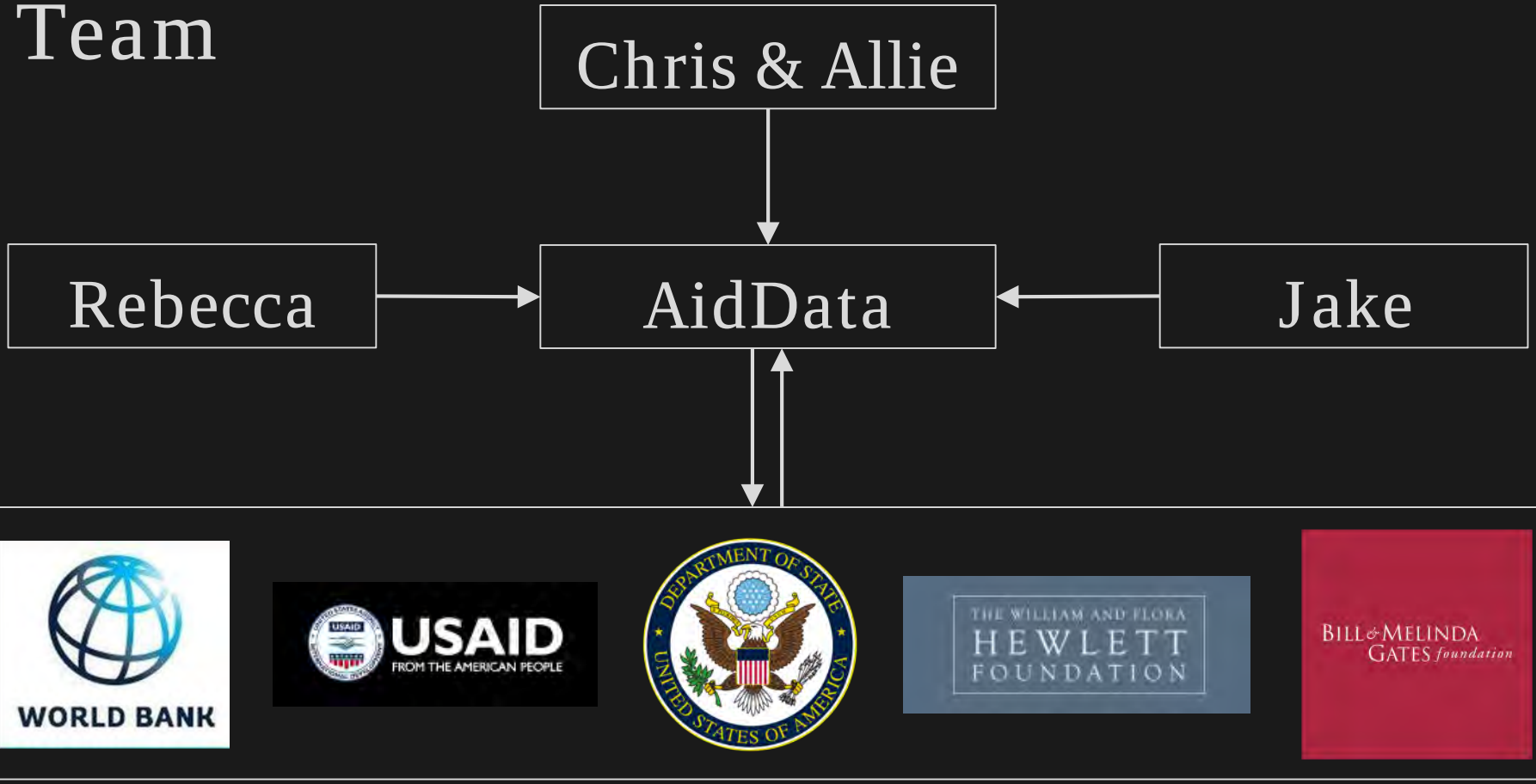
Step 3 - Compare aid flows to demand

Step 4 - Produce ranking and subnational case study

Scalability

Outreach & Distribution

Team


Chris & Allie
Rebecca
AidData
Jake
WORLD BANK
USAID
FROM THE AMERICAN PEOPLE
DEPARTMENT OF STATE
UNITED STATES OF AMERICA
THE WILLIAM AND FLORA
HEWLETT
FOUNDATION
BILL & MELINDA
GATES foundation

Milestones & Financing

Fall Semester - $4,900

- Code data
- Analyze data
- Produce Malawi case study

Spring Semester - $2,995

- Create ranking

Budget:

$7,895

DEVELOPMENT
GOALS
MALI

Indexing Taxation

George Moss

Caroline Nutter

Tax Revenue Overview

10 - 20 % of GDP
(Developing Countries)

40 - 50 % of GDP
(Developed Countries)

$100bn in lost tax
revenue each year

SOCIOECONOMIC STATUS
THE
POVERTY
CYCLE
JOB OPPORTUNITIES
COLLEGE AFFORDABILITY & ACCESSIBILITY

AID

What Has Worked

530 regulatory reforms and 45 ministerial committees formed

Regular testimonies before Congress and a primary resource for country eligibility at MCC

Downloadable data in a public domain that’s accessible and user-friendly

THE WORLD BANK

IBRD • IDA | WORLD BANK GROUP

Beneficial to all

at World Bank:

- Tax Administration Modernization Project
- Tax Reform Adjustment Loan Project

at USAID:

- Armenian Tax Reform Project
- Property Tax Reform Project

Impact

DOING BUSINESS RANKINGS

Country	Global Rank 2012	Global Rank 2011*	MENA Rank 2012
Saudi Arabia	12	10	1
UAE	33	35	2
Qatar	36	38	3
Bahrain	38	33	4
Tunisia	46	40	5
Oman	49	53	6
Kuwait	67	71	7
Morocco	94	115	8
Jordan	96	95	9
Yemen	99	94	10
Lebanon	104	103	11

EASE OF DOING BUSINESS

The chart presents the Ease of Doing Business ranking on key parameters (out of 189 economies).

	DB 2016 rank	DB 2015 rank	Change in rank
Starting a business ✓	**155**	164	▲ 9
Dealing with construction permits	**183**	184	▲ 1
Getting electricity ✓	**70**	99	▲ 29
Registering property	**138**	138	No change
Getting credit	**42**	36	▼ 6
Protecting minority investors	**8**	8	No change
Paying taxes	**157**	156	▼ 1
Trading across borders	**133**	133	No change
Enforcing contracts	**178**	178	No change
Resolving insolvency	**136**	136	No change

✓=Doing Business reform making it easier to do business. ×=Change making it more difficult to do business

Source: World Bank

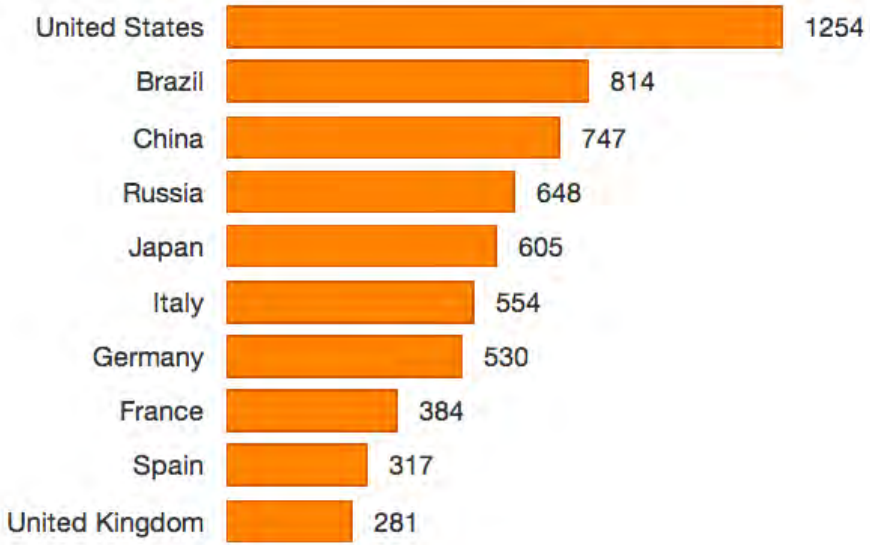
INTERNATIONAL MONETARY FUND

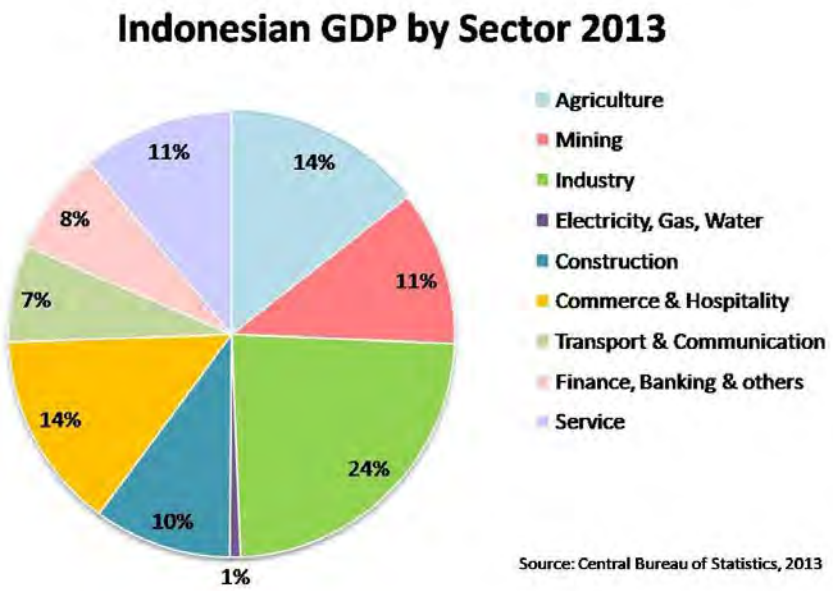
ITRAF
INTERNATIONAL TAX RESEARCH AND ANALYSIS FOUNDATION

THE WORLD BANK
IBRD • IDA | WORLD BANK GROUP

All values in US$ bn

Size of shadow economy	Tax lost	Tax lost as % GDP





Research	$3,500
Mentor	$1,000
Travel	$ 490
Domain	+ $ 10
	$5,000

Phase 1: Publish data

-By end of 2017: Indexing for at least 50 countries

-By end of spring 2018: full index completed and published on online domain

Phase 2: Partner takes on report

taxation
concept
report
tax
money
paper
budget
financial
return
account
business
schedule
wealth
debt
rate
pay
income
finance
accounting
refund
irs
dollar
burden
calculator
expenses
fiscal
currency
balance
businessman
collection
investment
season
figure
paperwork
mortgage
inland
industry
economic
office
form
crisis
internal
trade
job
cash
control
background
sign
document
profit
solution
federal
savings
number
inspection
company
entrepreneur
credit
economy
salary
stock
growth
annual
enterprise
payment
service
revenue
treasury
file
banking
invest
risk
work
pen
bill
government
cost
data
accountant
time
bills
loss
capital
busy

Mapping Urban Food Insecurity in the Developing World

Max Maiello and
Elizabeth Sutterlin

Urban Growth - Shrinking Market Access

United Nations *The World's Cities in 2016*

“Data on urban food insecurity is sparse at best.”

- Arif Husain

Chief Economist, World Food Programme

Using Data to Understand Food Insecurity

City Population Data

Remote Mobile (SMS) Surveys

Pilot Study: Hyderabad, India

- Distance traveled for food
- Physical obstacles to food
- Informal markets and vendors
- Traditional markets
- Ability to cook in

Available Data

WFP
World Food Programme

Google earth

NASA SERVIR

Mobile (SMS) Surveys

WFP
wfp.org
vam
food security analysis

engageSPARK
Voice & SMS Text campaigns made EASY

Policy Relevance

- Identify the most in-need neighborhoods and city sectors
- Target efficient locations for food aid
- Recommend improvements in planning for urban planners and city officials

Deliverables

- Collected data on neighborhoods and food sources in our pilot city (Hyderabad, India)
- Report summarizing and analyzing the results of our data collection
- Dissemination of results through online publication and through food aid and urban development organizations

Project Timeline

Fall 2017 Semester

- Gather and catalogue population and poverty data from pilot city of Hyderabad, India
- Remote mobile survey certification
- Develop list of survey questions
- Identify translator(s) for survey
- Implement survey

Project Timeline

Spring 2018 Semester

- Catalogue and analyze translated survey results
- Produce deliverable report
    - Visual summaries
    - Breakdowns of results
    - Further applications
- Present and distribute report

Project Budget

Budget Item	Cost
Mentor stipend	$1,000
Research stipends	$3,000
Survey Implementation	$1000
Mobile phone credits for survey participants	$500
Salary for translator(s)	$500
TOTAL ASK	**$6,000**

Global Media Perceptions of U.S. Foreign Policy

Katherine Armstrong
Jack Shangraw

Deteriorating U.S. Image

Bush ignored warnings on Iraq insurgency threat before invasion

Intelligence suggested country faced years of tumult

-*The Guardian* (UK), September 29, 2004

Deteriorating U.S. Image

Berlin Complains

Did US Tap Chancellor Merkel's Mobile Phone?

Berlin is taking seriously indications that Chancellor Angela Merkel's mobile phone might have been tapped by US intelligence, according to SPIEGEL information. Merkel spoke with President Barack Obama on Wednesday about her concerns.

-*Der Spiegel* (Germany), October 3, 2013

Deteriorating U.S. Image

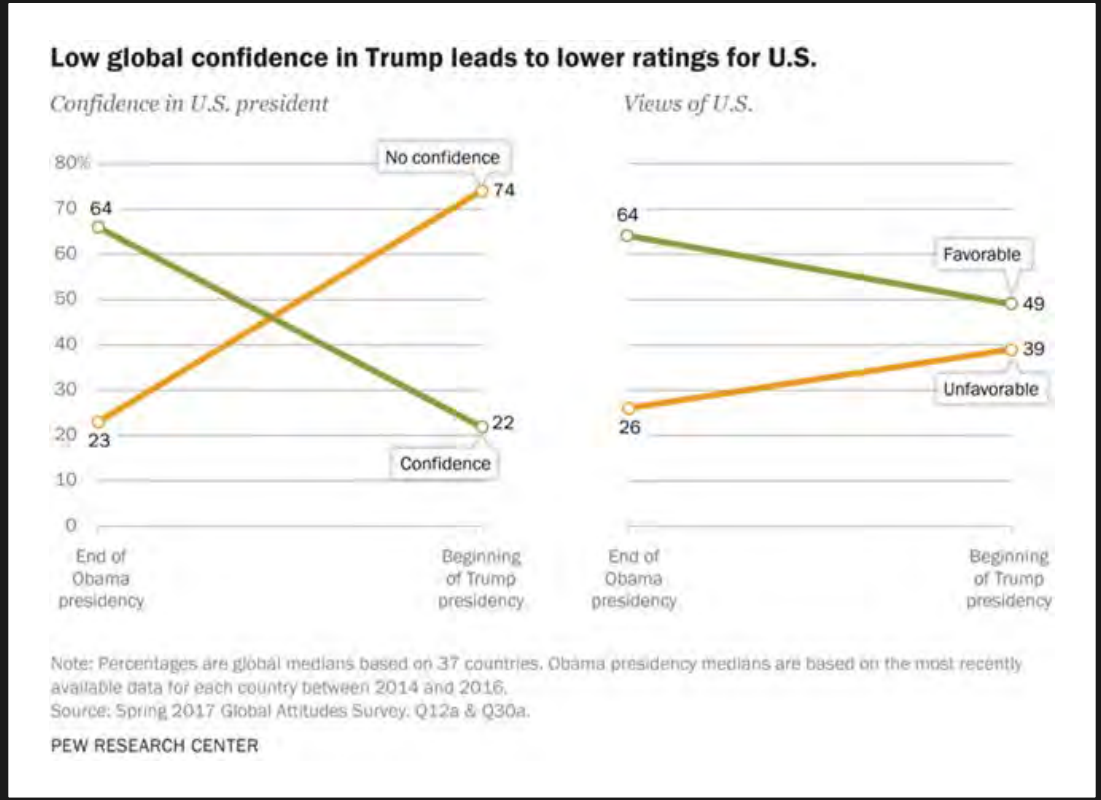
News › World › Americas

US lays out visa criteria for Donald Trump's controversial 'Muslim travel ban'

Grandparents and fiancees will not be considered close relationships under new plan, potentially breaking up thousands of families

-*The Independent* (UK), June 29, 2017

Deteriorating U.S. Image



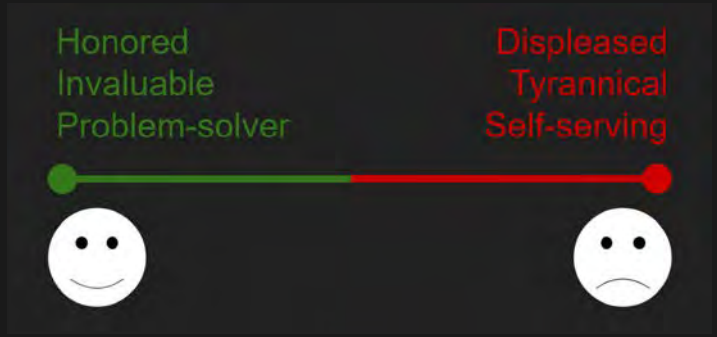
Sentiment Tracking Tool

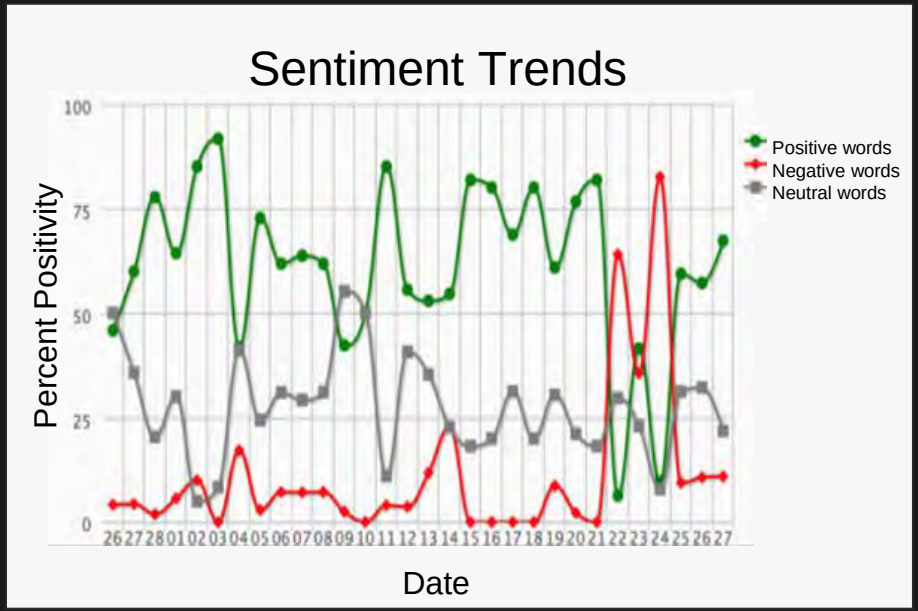
Honored
Invaluable
Problem-solver

Displeased
Tyrannical
Self-serving

Methodology

Methodology





Why Media?

- Continuous
- Readily available
- Cost-efficient
- Near real-time

Beneficiaries

Government

NGOs

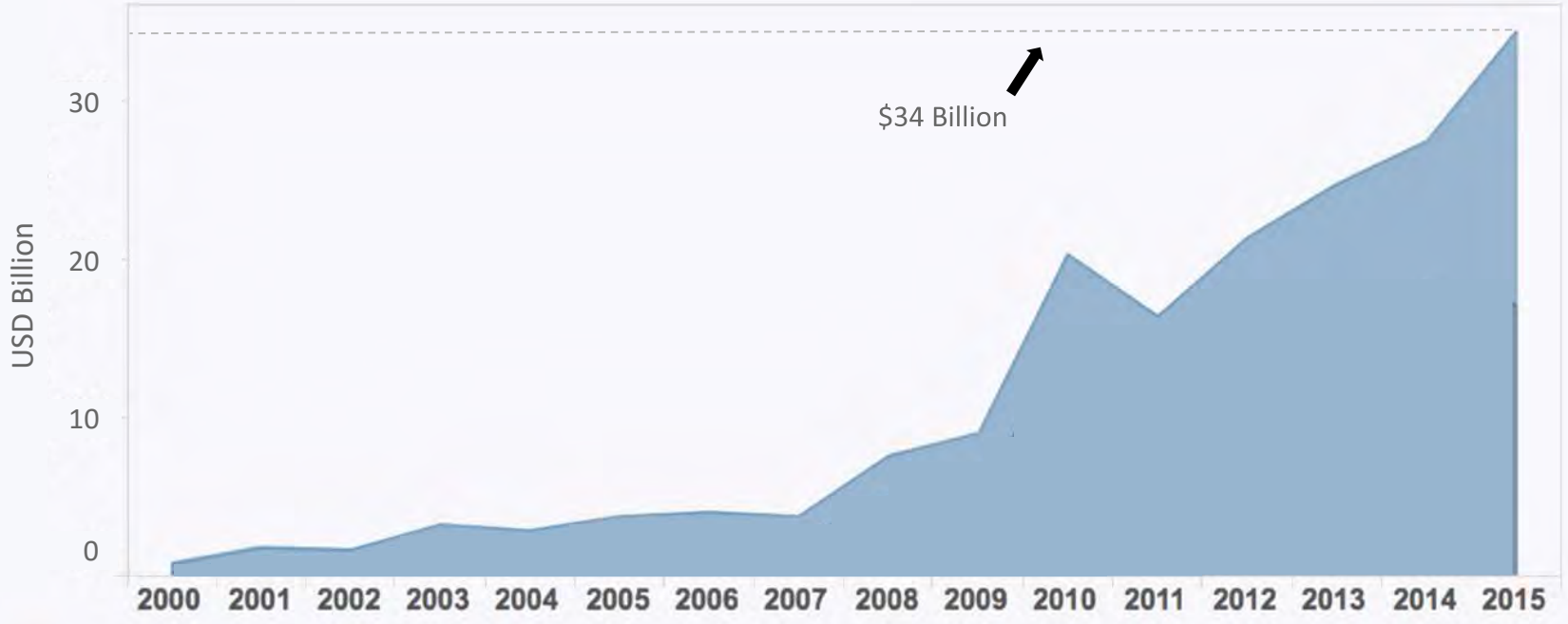
Media

Preserving Global Leadership

IDENTITY MESSAGING AND ENVIRONMENTAL DEVELOPMENT

Michael Giovanniello
Anatoly Osgood

CLIMATE-RELATED DEVELOPMENT AID



Project Outcomes in Malawi

-Transition to drought resistant crops hailed as saving the country

-Still has the highest deforestation rate in Africa

-Why such different outcomes?

It’s the Communication, Stupid

- Receptive communities are essential
- How to convince recipients
- Shortcomings in issue-specific

HYPOTHESIS

If individuals perceive their group as prioritizing climate change action then, they will have higher support for local environmental development projects.

METHODOLOGY

01

MEASURE MODERATING VARIABLE

How closely respondent aligns with group-identity used in treatment

02

APPLY TREATMENT

Information suggesting prominent identity-group supports action

03

MEASURE TREATMENT EFFECT

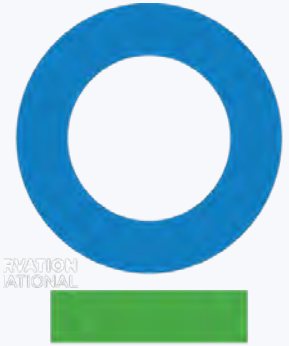
Inform recipients about a potential environmental development project in their community

TARGET AUDIENCE

PEACE CORPS

WORLD BANK

UNDP



CONSERVATION INTERNATIONAL

APPROACH AND MILESTONES

CONCLUSION

PROBLEM

Environmental development communication often fails

SOLUTION

$9,970 → how group-identity increase support for climate change development projects

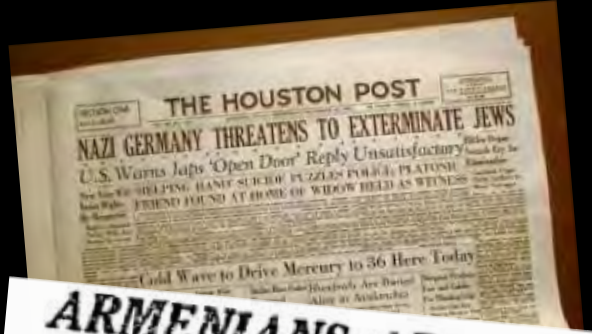
IMPACT AND SCALABILITY

Potential to improve communication strategies throughout all development fields

TRACKING TARGETS

IDENTIFYING ETHNIC MINORITY VIOLENCE

Sami Tewolde and Lincoln Zaleski



THE HOUSTON POST

NAZI GERMANY THREATENS TO EXTERMINATE JEWS

U.S. Warns Japs 'Open Door' Reply Unsatisfactory

Cold Wave to Drive Mercury to 36 Here Today

Serbs expel Muslims; mass graves uncovered

By MAUD S. BEELMAN
Associated Press Writer

SARAJEVO, Bosnia-Herzegovina — A mass grave filled with 640 bodies was unearthed in northeastern Bosnia after government forces recaptured the area from rebel Serbs, Bosnia's prime minister said Saturday.

It was unclear whose bodies were in the grave, but they were believed to be Muslims and Croats killed by Bosnian Serbs, said Prime Minister Haris Silajdzic.

The discovery coincided with word of the latest ethnic expulsion by Bosnian Serbs: the driving of almost 5,000 Muslims from another Serb-held town under government attack. Expellees have picked up across Bosnia as a peace deal that would separate ethnic groups grows more likely.

Violence against civilians has been one of the hallmarks of the four years of war in the Balkans, but tales of horror have grown more intense in recent weeks as sharp battlefield gains have won Muslims, Croats and Serbs cities forcing the exodus.

Mass graves are "a grim reality that we will be facing while liberating Bosnia-Herzegovina," Silajdzic told The Associated Press.

He said experts were examining the bodies found in Kravanjske, near a major road junction about 20 miles southeast of Sarajevo.

Serb authorities are silent on the discovery. Muslim-led government officials in Sarajevo, the capital, say it is doubtful whether it is paying too heavy a price for a U.S.-peace plan, which would give the Serbs nearly half of Bosnia. Talks are scheduled in New York on Tuesday.

Recent offensives by government and Croat forces have stripped large chunks of territory from the Serb rebels, and some Bosnians wonder whether they should try to reconcile the Serbs and assign atrocities rather than end the war.

And members reported Serbs on Friday drove 480 Muslims from the town of Doboj, a key road and rail junction in northern Bosnia that is under increasing attack from the government army.

Many of the Muslims "were given as little as five minutes basically to pack up," said Kris Janowski of the U.N. High Commissioner for Refugees.

"Their belongings were stolen. Some of them were beaten up," he said. All were forced to walk about 12 miles through the forest in the middle of the night, he said.

Some of the Muslims claimed old people died on that trek, but the United Nations could not confirm the claims, Janowski said.

Meanwhile, aid workers are reporting severe food shortages in Gorazde, the sole Muslim enclave left in eastern Bosnia. Almost the entire population of 37,000 is dependent on outside aid and is squeezed into an area too small for much effective cultivation of crops.

On Saturday, an aid convoy arrived with about 300 tons of food and materials needed to survive the winter.

The United States is pushing hard to wrap up a peace deal in Bosnia after the warring parties agreed Sept. 8 in Geneva to cede the state, with 51 percent for Muslims and Croats and 49 percent for the Serbs.

ARMENIANS ARE SENT TO PERISH IN DESERT

Turks Accused of Plan to Exterminate Whole Population—People of Karahissar Massacred.

Special Cable to THE NEW YORK TIMES.

Mirror

Report by JOHN PILGER
Pictures by ERIC PIPER

Death of a Nation

PROBLEM

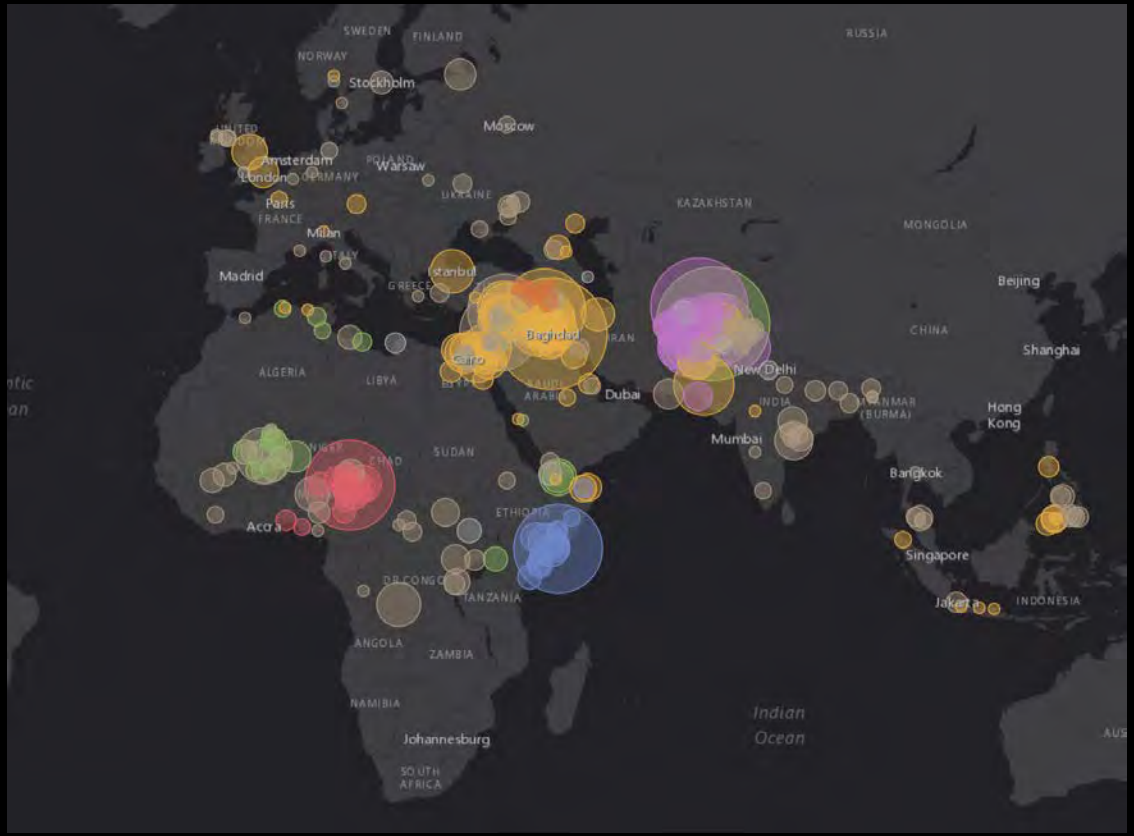
- Data is *SCATTERED*
- Lack of access to WHERE specifically this ethnic violence occurs
- Organizations are aiming in the DARK

Significant gaps in the understanding of the geopolitical implications of minority relations

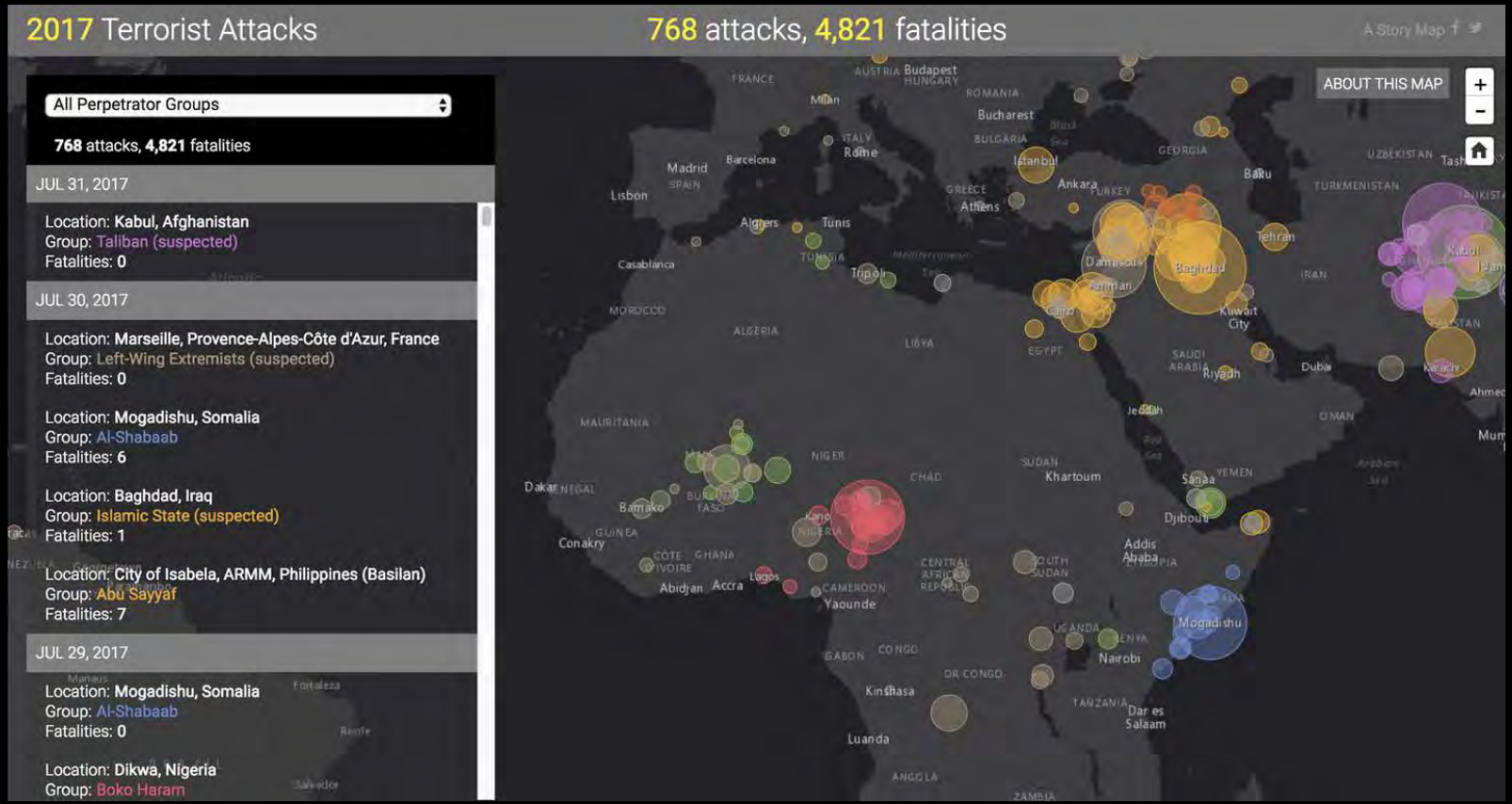
SOLUTION

Creation of a tool that will bring critical geospatial information to organizations that affect change

OPTION 1: Series of Static Maps



OPTION 2: Interactive Map



“A geocoded map of ethnic violence would be an essential tool for the international community…This is not something we already have, and we need to.” - Arslan Malik (Former UN Peacekeeping Senior Policy Advisor)

“This is not something we have…we need to”

“Essential tool”

“Extremely useful”

“A geocoded map would be extremely useful…and this is an enormously important area. -Johanna Birnir (Director, All Minorities at Risk)

“Enormously important area”

HPN
Humanitarian
Practice Network
Managed by
Humanitarian Policy Group

GCTF
GLOBAL COUNTERTERRORISM FORUM

HUMAN
RIGHTS
WATCH

THE INTERNATIONAL
CENTRE FOR THE STUDY
OF RADICALISATION AND
POLITICAL VIOLENCE
ICSR

Alliance for
Peacebuilding
Advancing sustainable peace and security worldwide

Minorities at Risk

IMPACT POTENTIAL

Building Block

Tool for Analysis

Public Good

Uighurs in China

MILESTONES

Oct. 1st, 2017: ArcGIS Learned

Oct. 15th, 2017: Merge GTD + AMAR

November 15th, 2017: MENA data geocoded onto the maps

March 1st, 2018: Asia data geocoded onto the maps

May 1st, 2018: Africa data geocoded onto the maps

Budget: Option 1
$5,340

	Fall Semester	Spring Semester	Total
Dan Runfola	$500	$500	$1000
Sami Tewolde	$960	$960	$1920
Lincoln Zaleski	$960	$960	$1920
Dissemination		$500	$500

Budget: Option 2
$8,340

	Fall Semester	Spring Semester	Total
Dan Runfola	$500	$500	$1000
Geospatial Specialist			~$3000 (Stipend)
Sami Tewolde	$960	$960	$1920
Lincoln Zaleski	$960	$960	$1920
Dissemination		$500	$500

Ethnic discrimination or violence affects *ALL* countries in Asia and the Middle East but three.

This is **not** an anomaly

This pattern is seen *worldwide*

Millions of people are affected

Flower