École de gestion TELFER School of Management

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Making it Happen - The Transition to a Sustainable Society

Proceedings – Workshop 1

Sustainability: Concepts and metrics

A review of the most compelling recent visions of sustainability

November 18, 2008

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Agenda

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2. Review of past low energy, low ecological footprint scenarios.
3. Open discussion. What should be the dimensions of a sustainable society? What should be the metrics?
4. Prioritization of target areas: what are the key targets we want to use or choose?
5. Converging on possible stretch targets for Ottawa Gatineau.

Opening remarks and discussion

In his introduction, Tom Brzustowski noted:

- many studies and initiatives have been undertaken, however the movement towards a sustainable society has been slower than expected;
- barriers to innovation are very important to identify and address and this is a key objective of the 'Making it Happen' project.

André recapped the project for the group. Key points included:

- The project has been live for approximately 6 months.
- The key objective of the project is to identify barriers to success and ways to address them.
- There are 3 phases in the project:
    - Setting targets for a sustainable society,
    - Identifying what needs to be done to get there,
    - Identifying the institutional barriers.
- Within the project, we will look at a hypothetical society (similar to Ottawa-Gatineau) and identify the 'stretch' targets for that type of region.
    - It is important that the targets are aggressive, but they must also be plausible in order for the exercise to be productive and valid.
- A detailed review of the agenda was presented – and worksheets were distributed for each participant to complete later in the session.

Introductions

- Each person introduced themselves and describe their perspective and the work that they do, or have been involved in, that is relevant to this project.

Discussion of past projects

- Participants recounted the challenges that were encountered in real projects with a focus on the targets and metrics that resulted from the projects.
- It was noted that output from this project (Making it Happen) may feed into the 'Choosing our Future' initiative being conducted by the City of Ottawa.
- Discussion began with comments from Sahrzad Rahbar. She noted;
    - In Canada, we always discuss 'production' of energy (and we are blessed with the diversity and abundance of energy resources).

  - In Japan, they have to import all energy resources which certainly changes their perspective and approach to sustainability and management of resources.
  - She spoke at length about the Cities Plus initiative. This project was a sustainability project undertaken to 'back-cast' objectives from 100 years in the future to today on the objectives and targets that would need to be achieved for a sustainable society – with Vancouver, Canada being the city in question.
    - See: http://www.citiesplus.ca/
  - Lloyd Axworthy and Mike Harcourt were key participants and champions of the project. The Sheltair Group won the competition to deliver the project.
  - The Canadian submission won the international competition.
  - Sahrzad noted that some learning has happened but there has been very little adoption (or take-up) of the results of the study by municipalities, governments or planners.
    - On this point she also noted that while only small adoptions have happened in Canada, numerous concepts from the study have been adopted and implementation in Japan.

- Mike Wiggin joined the conversation with the following notes;
  - One of the very positive outcomes of the Cities Plus project was to ingrain in people that it's critical to discuss and understand sustainability as a concept before moving to discussion on solutions (i.e. the context of sustainability is critical).
  - It was interesting to identify trends and then explore them from an environmental perspective. This helped to clearly identify that city objectives or trends (i.e. the population doubling) would reveal the key environmental constraints to be encountered in the future.
  - He noted that 'visioning' is a key part of sustainability planning and it was noted that this is very prevalent and understood in many other countries but less prevalent in North America.
  - He reiterated that the 100 year horizon removed the short-term 'threat' and allowed people to think freely without short-term thinking, worries and fears clouding the discussion.
- André asked: "Even though wholesale adoption of the study didn't happen, were there other positive peripheral effects?"
- Responses:
  - It was noted that some impacts happened at the local level, but only 'Imagine Calgary' was noted as a local program that drew directly from Cities Plus.
  - It was noted that a five-year review of Cities Plus was not conducted but that a 10 year review is being proposed and is very likely to happen.

  - 'Imagine Calgary' was mentioned as a group/program that is doing very interesting work that would have drawn on some of the outputs of Cities Plus.
    - See http://www.imaginecalgary.ca/
- Alex brought up an example of 'decision-making' in municipalities as a barrier to implementing effective programs:

  Barrier: Decision-making processes in municipalities
- Mike Wiggin continued:
  - During the Cities Plus project, the term 'one-system' approach was coined. This approach means that addressing problems and solutions should start on the demand side and always by addressing demand and supply issues in tandem.
  - It was pointed out that many studies have been conducted but the fact that these studies have not been adopted in any major fashion is part of the reason that we are here and developing another vision. It was noted that some of the reasons for 'slow' adoption of sustainability initiatives might be identified during the 'barriers' discussion later in this session.
- David Brooks referred to a 1976 article by Amory Lovins – Energy Strategy; The Road Not Taken
    - See http://www.rmi.org/images/PDFs/Energy/E77-01_TheRoadNotTaken.pdf
  - He noted four key questions to be asked about demand:
    - Why do we need this energy?
    - Pay attention to the quality of energy as well as the quantity?
    - What are the criteria for sustainable energy?
    - Approach demand analysis using back-casting.
  - He discussed the Water Soft Path Project at some length
    - See http://www.foecanada.org/WSP%20Lexicon/Feasibility%20Study%20-%20Ontario.pdf
  - The study was published in 1983 funded by Energy, Mines and Resources
  - He pointed out that water is different from electricity or gas – as we want water for 'lifestyle' not just for service – which makes it a more complex resource to manage as there are other 'demands' on water that do not affect other natural resources.
- Brooks stated that a 'soft path' study has three broad elements;
  - The study must have a vision.
  - The study needs to be highly analytical (ie: You can't just be dreaming – the study must be based in some level of factual information).
  - The study must deliver planning tools to people and industry.
- He noted that a planning tool (modeller) called ***scenario builder*** has been developed and is described in a one chapter of an upcoming text on

sustainable society that is not yet published. He could make the particular Chapter available to the project team.

- Diane Beckett mentioned a program called 'Bullfrog Power'. 7,500 homes and 800 buildings are involved.
    - If a business is using 'Bullfrog Power' it means that for every kilowatt hour of energy they purchase and use; Bullfrog Power will purchase a kilowatt hour of 'clean' energy and put it back into the grid.
    - It was noted that this represents innovation in a business model – exactly the type of innovative thinking required to support sustainable municipalities. See http://www.bullfrogpower.com/
- Tom Brzustowski noted that countries at the fore-front of environmental programs are the countries that have little or no natural resources while Canada (with its abundance of resources) has taken longer to address the demand side than other countries (with no natural resources).
- Sahrzad Rahbar described QUEST and its objectives
    - QUEST is a group of key leaders in government, industry and finance involved in discussions on how to move the sustainability agenda forward.
    - Natural Resources Canada is leading inter-governmental conversations to analyze community-level information.
    - A conference has not been held, but the group meets periodically to discuss issues and actions that can be taken.
    - Provincial interest is growing – the model of QUEST is a coalition – and the main purpose is to lead and drive the 'focused conversation' in order to influence policy and industry activity.
- David Miller from City of Ottawa discussed the city's projects.
    - He noted that City of Ottawa planning is in the 20 year timeframe and that policy and objectives are set against that planning window.
    - Water, transportation and waste targets are all set in isolation based around the city growth plan – which is not an optimal situation.
    - The City of Ottawa is always looking for incentives to motivate the community to change behaviour. Targets are specifically set within different areas of the environment and then monitored by the City.
    - Unlike 50 and 100 year planning efforts, the 20 year planning timeframe is short enough that the direct interests of the stakeholders are affected and therefore input and influence is exercised during the planning process – based on the more urgent needs of the city and its inhabitants. The result is that changes are always incremental rather than 'fundamental'. It is the nature of the planning process and timeframe.
    - The major planning initiative happening within the City of Ottawa is 'Choosing our Future'; which is currently in its formative stages

        - One of the key ideas within 'Choosing our Future' is to expand the timeframe and remove the direct impact on stakeholders who are engaged in the planning process
- Sally McIntyre from the City of Ottawa was invited to discuss water planning as conducted by the City of Ottawa.
    - Sally highlighted the effect of changes in the plumbing code wrt low flow toilets on demand management (demand forecasting and planning).
    - An existing building stock was taken in 1993 and it was determined that these home owners would be hard to reach and influence.
    - The approach for reaching these home and building owners is:
        - Inform
        - Provide incentives
        - Regulate
        - Introduce pricing Incentives (the most powerful).
    - A very important consideration is that water systems must be designed to meet peak demand – not average demand.
    - An example of a success was provided:
        - If the City of Ottawa was to be able to reduce peak demand by a certain amount, the net benefit could be the delay in constructing a new generation plant for 10 years.
    - City of Ottawa water reduction objectives were set in 2007;
        - Objective: To reduce peak water supply by 50% by 2017.
    - The program is ahead of meeting this objective.
        - But, there is a peripheral effect (challenge); reduced water consumption reduces City of Ottawa revenues. It is a concern and the revenue/expense/investment model may need to be revisited in the future as to not 'punish' success.
- Mike Wiggins pointed out that there is a strong correlation between energy efficiency and water efficiency and there was general agreement that this holds true.
- David Brooks pointed out that the absolute water demand in the USA is going down – so this is an area where success can be realized.
- Sally continued by speaking about the City of Ottawa – Cost, Revenue and Rate Study.
    - This initiative has a 50 year planning horizon; casting out 50 years on capacity to deliver, reduction targets, etc.
    - One of the major challenges is current pipe infrastructure and how to remedy the fact that the pipe infrastructure was designed to handle a city of 50K and now we are at 800K.
    - City of Ottawa gets money from:
        - Taxes
        - Rates
        - Transfers

        - Development Charges (growth in population in the City).
- David Brooks asked:
    - Why is pricing incentive #4 on the list of strategies to reduce water consumption? Why does City Council struggle with this? Sally responded:
        - The City of Ottawa is mandated by law to do full cost recovery. Currently there is not a clear line between how revenues are brought in vs. how they are spent. This line needs to be drawn and made clear before 'price incentives' can be offered to consumers.
        - There needs to be a cost incurred that will be reduced in order to offer incentives. The City cannot just offer an incentive with the reason being to 'modify consumer behaviour'.
        - **Barrier**: Separation between operational and capital budgets is a major barrier to long term visioning and planning. Councillors are challenged to explain a municipal program to the consumer (especially a long-term planning objectives).
- Natividad Urquizo provided the following comments to the discussion:
    - In Quebec, there is a fixed fee cost for water which is dramatically different from the Ontario system.
    - She noted that in Canada, people don't think they should pay for water.
    - **Barrier:** Entitlement. Natividad cited entitlement (i.e. people think water should be free) as a barrier to implementing meaningful programs that link demand to costing.

Target setting

- André opened up the discussion to identify possible targets for 50 years:
    - City of Ottawa representatives identified growth projections,
    - 2030 Ottawa- Gatineau population; 1.2 million,
    - Current population; 800,000,
    - Some discussion ensued around growth for the region.
- André 'reset expectations' that we are setting targets for a 'hypothetical' region - with the idea of identifying the barriers that need to be addressed.

- David Brooks cautioned that 'footprint' analysis can be confusing. It was generally agreed that focusing on 'unit' targets and the subsequent 'aggregate' targets would be the best approach for target setting.

- Sally pointed out that the targets that are being set will not 'ignite' the consumer, but André suggested that the targets we are setting today are not designed to ignite the consumer and that the targets being set by the 'Making it Happen' project – do not necessarily need to be sold to the public.

Presentation / discussion with Ralph Torrie (teleconference)

- Ralph led the 2002 Study for the Suzuki Foundation called 'Kyoto and Beyond and was asked to speak about this:
    - See: http://www.davidsuzuki.org/files/Kyoto_72.pdf
- The purpose of this study was to consider what the country would look like in 2030 if GHG emissions were reduced by 50%.
- Analyzing each of the supply channels would not get you where you needed to go, because you miss the great strides that must be gained from the demand side.
- One of the early challenges was just to make anyone believe that you could actually achieve a 50% reduction in GHG reduction.
- It was determined that the reductions were feasible based on existing technology (or technology under development).
- It was determined that a deep emission reduction future was achievable from an economic perspective.
- These two determinations were the key outputs of the Kyoto and Beyond Report conducted for the Suzuki Foundation.
- Municipalities have control (direct or indirect) over 50% of GHG emissions for a City.
- André asked for Ralph's opinion on how we should set our targets and what 'type' of metrics should be used (see earlier comments on target setting);
- Ralph discussed GHG reduction targets
    - Scientists are suggesting that stretch objectives (virtually unachievable) must be set in order for sustainable targets to be reached.
    - All targets must be coupled with the economic imperative that exists to support environmental change.
    - It was discussed that public transit does not make a 'singular case' for GHG reduction, but the other benefits are great; i.e. densification stimulates urban economy and other benefits: therefore many changes need to be associated with all of their benefits not just the GHG reduction benefit.
    - Ralph pointed out that the *2002 Kyoto and Beyond* targets were not necessarily more aggressive than the *NTREE 2050* Report.
        - See: http://www.nrtee-trnee.com/eng/publications/getting-to-2050/Getting-to-2050-low-res.pdf
- **Barrier:** Financial incentives do not exist for 'first-time' investment for home owners and even building owners.
- Ralph asked:
    - What are the levers that local and regional government can use to influence or incent industry to take part in the solutions from a financial and logistical perspective?

- When political will is absent – for reducing GHG emissions – the question to ask is what is it that motivates and excites the decision-makers and offer that (and build GHG emissions as a benefit of the programs that decision-makers will get excited about)
- People are very excited about getting into Green Buildings; the fuel and electricity benefits are great but the benefits of having motivated, excited employees who get more daylight and other benefits is something that decision-makers can get into.
- Businesses of the past needed to be near railways, highways and other infrastructure. Businesses want to be located where people want to live – hence the need for and interest in densification in a green, environmentally friendly way.
- Segments of the market respond well to regulation: Cars and home appliances are good examples of this.
- The ideas and suggestions that emerge from the 'Making it Happen' project must be attractive to politicians and decision-makers.

Identification of Targets / Objectives

- Participants identified targets/objectives that could be used to measure the level of sustainability for a region – in 50 and 100 year planning timeframes.
- Forty targets/objectives were identified
- Each participant then selected the six items which they felt were the most important.
- The results of participants selections are indicated below using * to indicate the number of times an item was chosen by participants.

1. ***GHG emissions per capita
2. *********Energy intensity of the economy
3. *Energy intensity of product / per capita
4. Energy user per capita
5. ********Water use – litres per capita (potable water)
6. *Capacity of a receiving body
    - discharge from a waste treatment centre
7. Rain vs. treated water vs. black water (toilet) – litres per capita used
8. **********Zero waste
9. Median income
10. Prosperity; GDP per capita
11. ****Continue to live, work and play with lower economic impact
12. Can we uncouple economic growth from consumption of materials and resources
13. Use and disposal of water, energy and materials
14. *Targets for % of renewable resources in use
15. Communities are liveable and prosperous
16. *Urban form

17. **Density
18. Proximity to public transit
19. Distribution of green space
20. Higher eco-density
21. Car ownership per capita
22. Commuting times - close to home philosophy
23. Forest cover / canopy – urban and rural
24. *********Air quality (smog days, particle matter, NOQs (?), more . . .)
25. *Transit ridership
26. *******Vehicle ownership
27. ***Housing affordability
28. Carbon neutral by 2030 for new and existing building stock
29. ***Food yield per hectare
30. Water usage by hectare
31. *Food: transport vs. water/local (?)
32. Students per teacher
33. *Health and well-being system
34. **********Self-sufficiency of a city, municipality and/or entity (what size) – degree to which it is self-sufficient
35. *Resiliency (ie: Future proofing; Emergency proofing)
36. A typical farm could be self-sufficient using technologies that exist today; but very few are - But the business model has not been put forward
37. Monitoring equity
38. Cultural and creative space
39. *Natural Steps
    - widely dispersed
    - not undermining others' ability to be sustainable

Some miscellaneous comments were made during brainstorming:

- See: http://www.naturalstep.ca
- It was noted that the 'detail' of the objectives is not important at this time. The objectives need to be 'stretch' enough that the qualitative objectives of environmental change are met.
- It was noted that the Choosing our Future objectives did not explicitly address energy objectives; although it was inferred in a few of the objectives – there isn't an objective that addresses energy reduction explicitly.

Results of Brainstorming and Assessment of Targets:

- There was a lot of convergence based on participants choices.
    - However, it could be deceiving;
        - The convergence happened towards the more broad objectives.
        - The objectives listed were at significantly different levels.
        - A roll-up, hierarchy is required to make sense of it.

- It was stated that rolling up, converging and wordsmithing ideas at this level could be an off-line activity that could be sent to committee members for comment and then reviewed at the next meeting.
- Discussion happened around numerous objectives. Some were converged and reworded as captured above in the Identification of Targets.

Major metrics:

- Based on the brainstorming exercise, selections by participants and subsequent discussion; the following items were identified as major metrics;
    - Energy use per capita.
    - Energy intensity.
    - GHG / capita.
    - Zero waste.
    - Air quality.
    - Water Usage.
    - Transportation.
- From this list and surrounding discussion and with some inspired analysis and summarization from Tom. The following context and objectives were put forward and generally agreed upon by the participants:

We consider an urban region, in many ways like Ottawa-Gatineau, to be a concentration of people who inhabit a very liveable community, import commodities and resources, and create value for their own use and for export. The following sustainable community objectives and targets may applicable for such a region:

- *The energy use for the whole region would be reduced by 50% and 75% over 50 and 100 years.*
- *Not allow GDP per capita to decrease (allowing for population increase).*
- *GDP per megajoule must go up.*
- *Decrease the consumption of potable water; of the whole community by a factor of 4 in 50 years and factor of 8 in 100 years.*
- *Reduce the amount of carbon-based energy in transportation by a factor of 10 in 50 years.*
- *Zero waste with appropriate treatment for organic and non-organic waste in 50 years.*
- *Decrease criteria air contaminants by 80% in 50 years, 90% in 100 years.*

Other notional objectives were discussed and noted during the discussion. They are as follows;

Energy per capita

Objective: Reduce energy consumption for the region
Actual: 100%
2058: Reduce by 50%
2108: Reduce by 75% from 2008 levels

Energy intensity

Objective: Use energy efficiently

GHG per capita

Objective: Reduce GHG emissions
Actual: 100%
2058: Reduce by 50%
2108: Reduce by 75% from 2008 levels

Zero Waste

Objective: Divert waste for appropriate treatment

Air Quality

Objective: Ottawa-Gatineau be a great place to live because of low pollution

Water Consumption

Objective: Reduce use of potable water
Actual: 100%
2058: Reduce by 25%
2108: Reduce by 50% from 2008 levels

Kms per person

Objective: Reduce carbon-based energy consumption / Replace car use with alternative forms of transportation
Actual: 100%
2058: Reduce by 50%
2108: ?

Green Space

Objective: Increase livability by maintaining/increasing green spaces

How to make it happen: (Closing discussion)

- André posed the question; 'Based on today's discussion and our collective knowledge and experience – what can be done to 'make it happen'?
- It was suggested that the town of Okotoks had made some major strides toward sustainability
    - **Barrier:** Both FUNDING MODELS and REGULATORY ENVIRONMENTS were major barriers to any sustainability initiative to overcome.
- There are game-changing barriers that will get in the way of achieving goals and objectives that are being set out within this project. None of them are technological. They fall into three major categories: institutional, capacity, and fiscal.
    - **Barrier:** An institutional barrier is the way municipalities balance the books. This is a constraint and the period for change would be very long to modify how financial structures are set and used to manage municipalities.

    - Institutional capacity for innovation needs to change for true progress to be made in creating 'cohesive systems' for environmental improvement.
    - Separate industries are siloes and in the major institutions and governments they remain a major barrier.
- It was noted that implementation of change is at the local level; the Federal Government can influence local action but implementation is local.
    - Where there has been local leadership and drive, that is where the most change and progress is being made.
- Getting builders involved will be key to increasing the operational capacity that is required to implement change.
- Mike Wiggins:
    - Providing a description of energy flows is a useful tool. This can indicate where emissions are happening and where energy is being used; this modelling can help municipalities to determine the factors that they can affect.
    - It is important to draft a story that indicates the consequences of current behaviour and the benefits of positive change; and the tools and technologies that are already available.
    - Communications of visions beyond 20 years is very difficult. They need to be dialled back into timeframes and objectives that people can understand.
- Sahrzad Rahbar
    - Many players need to come to the table with their expertise to address environmental change issues effectively.
- Diane Beckett
    - The players are all engaged and interested but are also hamstrung in effecting real change.
- Eric Boutet
    - Most players understand the collective benefit of getting involved in environmental change to support sustainable communities – but don't understand the personal or singular benefit to them.
- Tom Brzustowski
    - The technology exists – but many people might believe that a new silver bullet will still be developed. People who work in the industry know that the technology exists but the public at large may not.
- Janet Haynes
    - Agreed that the technology is there but people might not be aware.

Summaries

Lessons Learned

- **Good**
    - Open discussion

    - Convergence on objectives
- **To do better**
    - The objectives were at many different levels. We could have defined this better
    - We gravitated towards the easy – high-level – objectives.
    - Could have had the grad students 'bucketize' the objectives during coffee time.
    - Could have stated real values (metrics) to support the objectives.
- **For next time**
    - Put a good package for pre-reading (it was noted that this was done well this time and should continue).
    - It was suggested that a 'theme' for each meeting would be published in advance.
    - A question was put forward:
        - What would be an imaginative way to aggregate the barriers?
    - Could we bring subject matter experts to speak to the group?
    - Could we find an example of something we would want to accomplish (within the hypothetical community) and then bring practitioners to discuss the practicality and barriers of the idea?

Barriers: (identified during session)

1. Decision-making processes in municipalities
2. Separation between operational and capital budgets is a major barrier to long term visioning and planning. Councillors are challenged in explaining a municipal program to the consumer (especially a long-term planning objective).
3. Entitlement. Natividad sighted entitlement (i.e. people think water should be free) as a barrier to implementing meaningful programs that link demand to costing.
4. Financial incentives do not exist for 'first-time' investment for home owners and even building owners
5. Both FUNDING MODELS and REGULATORY ENVIRONMENTS were major barriers to any sustainability initiative to overcome.
6. An institutional barrier is the way municipalities balance the books. This is a constraint and the period for change would be very long to modify how financial structures are set and used to manage municipalities.
7. Institutional capacity for innovation needs to change for true progress to be made in creating 'cohesive systems' for environmental improvement.
8. Separate industries are siloes and in the major institutions and governments they remain a major barrier.

Action items

1. Follow up with participants or research Cities Plus information website to identify tangible impacts of the project.
2. Retrieve 'scenario builder' Chapter from David Brooks.

3. André asked David Brooks to identify targets that were identified during the Soft Path exercises.
4. QUEST reference information to be provided by André.
5. Ralph Torrie has a report on energy end-use stats for the 'old City of Ottawa'. Action to André to get this from Ralph.
6. André to follow up with Mike Wiggins for references on Okotoks.
7. Janet will be providing the contact name of person for community in Australia that has done some great work.

References

1. http://www.citiesplus.ca/
2. http://www.rmi.org/images/PDFs/Energy/E77-01_TheRoadNotTaken.pdf
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6. http://www.nrtee-trnee.com/eng/publications/getting-to-2050/Getting-to-2050-low-res.pdf
7. http://www.naturalstep.ca

Reference Summary from Dianne Beckett: (participant pre-work)

The reference lists were provided by academics, community activists, government officials, consultants, ENGO staff, and political advisers; as well as young professionals and professionals who were working on sustainability in the 1970's.

The respondents provided more than a list of sustainability documents, they often provided a context and a philosophical framework, and many provided events and issues that marked historical milestones including the green revolution, biodiversity, acid rain, the oil crisis and water shortages.

What I consider to be classic reports were well represented in the submissions including Brundtland, Limits to Growth, Conserver Society, Soft Energy Path, Small is Beautiful, Silent Spring, IPCC documents, Millennium Ecosystem Assessment, Millennium Development Goals and Odum's works on ecology. UN initiatives were also well represented including Brundltand, UNCED, and Agenda 21 as well as the Earth Charter, the NGO response. NGO documents were identified, especially the work of IUCN's World Conservation Strategy initiative. Several interesting non-Canadian initiatives were identified including the constitution of Ecuador and environment policy in the Netherlands. A number of authors were mentioned by a number of respondents; Amory Lovins was identified more often than any other individual but Paul Hawken, Ralph Torrie, Lester Brown and Jeffrey Sachs were on more than one list. The respondents were broad thinkers and the suggestions ranged from Gerald Durrell, author of animal stories to Mahatma Gandhi.

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